

# The Boston Medical and Surgical Journal

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## Address.

ADDRESS AT THE AWARDING OF THE JOHN HARVARD SCHOLARSHIPS—1916.

BY ABNER POST, M.D., BOSTON.

HARVARD UNIVERSITY has established the John Harvard scholarships for the recognition and encouragement of sound learning, and she bestows these scholarships upon certain undergraduates whose work during the preceding college year entitles them to very high academic distinction, and, as certain of these scholarships are also bestowed upon students of medicine, it seems appropriate to consider, somewhat easily, in the few moments at our command, the Scholar in Medicine,—what he is, what he has done, and what he may do.

Medicine is a learned profession, but the learning of its members varies. Not all can be called scholars. Not fifty years ago Harvard, in common with other schools, admitted to its medical courses all comers without entrance examinations and graduated them with an oral examination. That condition did not call for a high grade of scholarship. Entrance requirements and State licensing boards have aided the schools somewhat in raising the average. But there have always been medical men whose learning has made them men of mark,—of equal standing with scholars in other fields.

Ideals of scholarship have varied with the centuries. To Erasmus, the great scholar of the Reformation, a knowledge of Greek and Hebrew and the Christian fathers was essen-

tial. The science of the present time was undreamed of.

Today, the Century Dictionary, defining a scholar, quotes the definition of Charles Sumner, which differs widely from the idea of four hundred years ago:

"By scholar, I mean a cultivator of liberal studies, a student of knowledge in its largest sense, not merely classical, not excluding what is exclusively called science in our day, but which was unknown when the title of scholar was first established."

SUMNER, *Orations*, 1, 137.

That definition is of the greatest value to our present purpose, for it recognizes that scholarship is not a matter of book knowledge alone, but includes science, of which the knowledge cannot be a matter of books alone. It involves study in the laboratory or in that field of nature where the particular science has its home.

Since Charles Sumner wrote that definition of scholarship, scientific knowledge has greatly increased, especially in that domain of science which pertains to medicine and which was unknown in the lifetime of Sumner, and scholarship in medicine includes very much more than natural science as usually understood. In medicine, we may properly call him a scholar who unites a knowledge of medical books and medical literature to a knowledge of the phenomena of life and disease as seen in the human being and our little brethren of earth and air. For the medical scholar, the phenomena of life and nature have taken the place of the writings of the Church fathers. The medical scholar is

more than a student; he is an indefatigable worker, a seeker after knowledge for its own sake,—knowledge in advance of others and also knowledge of what men have known before him. There must also be a certain bookish flavor about him before we can call him a scholar. He must be a student of his profession and he must love its literature. We can hardly conceive such a man who does not also love the literature of all the ages. He loves books and treasures them. He appreciates Cicero's tribute to liberal studies in his plea for the poet Archias: "For other occupations are not suited to every time, or to every age or place; but these studies are the food of youth, the delight of old age, the ornament of prosperity, the refuge and comfort of adversity; a delight at home and no hindrance abroad; they are companions by night and in travel and in the country."

Scholarship is unselfish, seeks knowledge for its own sake and takes pleasure in imparting it; it seeks to make experience profitable. A medical scholar makes the bitter experience of disease and death conduce to the good of future days, for the human body is his most treasured book, with all its wondrous revelations.

Doubtless there are medical scholars who are recluses, who are content to pore over the records of the past, who know the physicians of the older days better than those of the present. Perhaps to many, the title of medical scholar would attach to them alone, but they deserve to be classed as misers who are content with the accumulation of literary riches. To me, the medical scholar is more likely to be also a man of action than the scholar in any other branch of learning. With so loose and liberal a definition, it is not easy to distinguish between the practitioner and the experimenter, the research student and the scholar; nor is it necessary for the present purpose.

The learning of medical scholars, as shown in their writings, reflects the spirit and the frailties of the age in which they lived. Their character varies with the advance of learning. Sometimes they discuss secular or religious, sometimes special medical topics, often they blend the three. Perhaps they are at their best when they record the things that have occurred under their observation, preserving for us the history of epidemics and prevailing diseases, or even the story of a single life.

The patron saint and godfather of so many hospitals, Saint Luke, we may look upon as the earliest medical scholar of the Christian Era. He is known to us better as a sacred historian than as a physician, but it is his narrative of our Lord's life which has preserved the stories of the healing of the sick and the raising of the dead, and the story of the good Samaritan who succored the wounded man while others passed by on the other side, and whose use of oil and

wine foreshadowed the present use of alcohol as a surgical dressing.

However one may regard those miraculous events, the narratives show the interest of the writer in the sick and the suffering, very much as a physician of the present day, writing a history which involved questions of life and death, health and disease, would be likely to dwell a little more fully than a non-medical historian, upon those matters.

It would be an endless task to trace the medical scholar from that day to our own, but coming down to a nearer period and confining our attention to men of English birth, one can scarcely avoid the mention of Sir Thomas Browne. His *Religio Medici* is an object of study for students of general literature and his urn burial has especially interested the advocates of cremation. One of his books was entitled *Pseudodoxia Epidemica*, or a Treatise on Vulgar and Common Errors, in which he rebuked the superstitions of the day; but he, himself, shared the current belief in witchcraft and gave testimony at a trial of two unfortunate, alleged witches which probably tended to their conviction.

Dr. John Halle has left us a poem more simple and direct in its diction than the writings of Sir Thomas Browne, but its value today is as great as in the sixteenth century when he wrote it.

"When thou arte calide at anye time  
A patient to see  
And doste perceave the cure to greate  
And ponderous for thee

See that thou laye disdeyne aside  
And pride of thyne owne skyle  
And think no shame counsell to take  
But rather wyth good wyle

Gette one or two of experte men  
To helpe thee in that nede  
And make them partakers wyth thee  
In that worke to procede.

But one thing note when two or more  
Together joyned be  
Aboute the painful patient  
See that ye doe agree.

For naughte can more discomforthe him  
That lies in grefe and payne  
Than heare that one of you dothe beare  
To other such disdeine.

Wherefore what so ye have to saye  
In things about your arte  
Let it be done among yourselves  
In secrete and aparte.

With one consent uniformely  
Comforte the wounded man  
But unto some good friend of hys  
Express alle that ye can

See thou dispraise none other man  
His error tho' thou knowe  
For sure another for thy plague  
Shall thee like curtyse shewe."

John Arbuthnot, M.D., of Aberdeen, was the companion of Pope, Gay, Swift and Parnell and reflected honor on our profession. In 1704, he published "An Argument for Divine Providence Drawn from the Equal Number of Births of Both Sexes," which procured his admission to the Royal Society. How shocked he would be today if he could know that there were in Germany over 780,000 surplus women, and in Austria 600,000, before the outbreak of the present war, and that a similar inequality exists in other nations. It is fortunate that the existence of Divine Providence does not depend upon an argument based upon such premises.

Dr. John Hall, of Shakespeare's time, is a name which stimulates our imagination and curiosity. He was respected in Stratford, where he lived, and married Shakespeare's daughter, Susanna. Did Shakespeare discuss with his son-in-law the various medical matters in his own plays which have excited so much comment in later days? It is a disappointment to find that Black, in his story of Judith Shakespeare, has so little to say about her medical brother-in-law.

Dr. John Brown of Edinburgh lived within the remembrance of some of us, and all of us know his "Rab and his Friends"—a story of appreciation of an animal friend, but also a description of the medical students of Edinburgh of his day. It was of them that he made the distinction between pity as an emotion and pity as a motive. In his somewhat boisterous students, pity as an emotion leading to tears and useless exclamations was dead, but as a motive inciting to help, it was alive and active.

America has been fruitful in medical scholars. Time fails us to speak of Rush and Jacob Bigelow and his son Henry, of Bowditch and Jackson, and the host whose names crowd upon us. We think of Holmes and Weir Mitchell, both of whom contributed alike to medical and general literature. One may feel that a medical education furnishes an admirable foundation for a literary career.

A monograph by Dr. Henry I. Bowditch on Diaphragmatic Hernia, deserves especial mention, as it illustrates scholarly work at the bedside, in the autopsy room, the library and the study. It was he who gave some of the oldest of us our first lessons in the use of the stethoscope. Going about the wards of the Massachusetts General Hospital with a class of students to study healthy lung and heart sounds, he came upon a young man with an injury, probably a fracture of the spine. Listening for the heart sounds, he found the heart dislocated to the right and only the sounds of intestinal gurgles in the left chest. He made the diagnosis of rupture of the diaphragm. When the patient died, a few days later, an autopsy was refused. Dr. Bowditch entered the autopsy room late at night and by the light of the moon made an examination which disclosed not a

rupture, but almost complete congenital absence of the left side of the diaphragm. Of this case, he wrote for his Harvard Class Book:

"The case interested me very deeply, and I looked in books and journals, American and foreign, for others similar. Between 1610 and 1846, I could find only eighty-eight cases. These I tabulated according to the 'Numerical Method' of my dear master Louis, and tried to extract from them all the truths they contained, anatomical, symptomatic, and causes; with diagnosis and prognosis as to the duration of life and treatment. I had a most delightful work, away from all the cares of common and professional life. I knew I was doing what had not been done before, and I knew that I must necessarily make a compact expression of the truth on the subject which would be worthy of respect and useful to any physician who should meet such a case. In my preface to the pamphlet (p. 77) that I printed from the *Journal*, I closed with these words, 'I hope that the memoir will be useful to the future student of Diaphragmatic Hernia, but the examination of it can never afford anyone a tithe of the pleasure or profit the original preparation of it afforded me.'"

As one of the foremost of American scholars must be mentioned John Billings. Graduated from a small medical college in the West, he served with distinction as a military surgeon during the Civil War and at its close was attached to Medical Headquarters at Washington. There, he was instrumental in building up the Library of the Surgeon General's Office until it ranks with the great libraries of Paris and London. He was the inspirer and first editor of the *Index Catalogue*, which is, practically, a catalogue of all medical books and an index to all medical journals, and, after retiring from the army by reason of years, he became the librarian of the New York Library. All medical scholars who have occasion to learn what their predecessors have done are indebted to the scholarship and industry of Dr. Billings. And I am sure we may include with him his friend and successor, Dr. Robert Fletcher and the Librarian of our Boston Medical Library, Dr. James R. Chadwick, for our Medical Library has greatly encouraged scholarship.

It was scholarly work to gather together all the scattered records of our Civil War and combine them in those volumes, clothed in green, which form a part of every medical library. One can read between their lines how little prepared was our profession for its work and, if we are capable of learning from the past, we may there learn the propriety of teaching something of military surgery and of camp hygiene to our present students—a necessity which we have reason to believe our University will, to some extent, supply in the near future.

It is interesting to note the fate that has fol-

lowed these scholars of the past. The names that have survived the longest are those of the men who have studied most closely the human body, which I have already designated as the medical student's most precious volume. Our anatomical and clinical vocabularies have perpetuated the names of these scholars more carefully than any hall of fame. It is the recorders of facts rather than opinions who have lived. The more we learn of these learned physicians dead and gone, the greater our reverence. They had their jealousies, their human frailties, but they were leaders of thought and they sought the good of the human race. Their names may perish, their books may become obsolete, but no man works as a true scholar, seeking knowledge for its own sake, and sharing it with his friends and his students, without leaving the world a little better for his labors. Their unrecognized influence lives about us still.

There is work for the present-day scholar. It must be a medical scholar who will deduce the lessons to be gathered from the fearful carnage of the present European war, even as the scholars of our Civil War gathered the lessons of those fateful years, so that all the wounds and human waste of this time of frightfulness shall not be entirely in vain.

Even the present athletic furor is not without its lessons for the medical scholar who tabulates the heart strain and measures and records the body waste. Never was a wider field open to the medical student.

One duty of the medical scholar of today will be to present to the intelligent public an honest view of life and disease, that the strange doctrines which flourish among us may cease to attract otherwise intelligent individuals.

Possibly scholars themselves need caution lest in rebuking the errors of others, the "pseudo-doxia epidemica" of the present day, they themselves shall merit the criticism of some individual who may speak to the John Harvard scholars of some future year.

In giving these John Harvard scholarships, the University grants no empty honor, for they carry with them not only their high academic distinction, but also a responsibility. There devolves upon these John Harvard scholars the duty that, so far as in them lies, they shall maintain for their chosen profession its rank as a scholarly and beneficent profession—a profession whose object is not alone the diminution of suffering, but the increase of knowledge and the improvement of the human race.

## Therapeutic and Preventive Medicine.

### TREATMENT OF DIABETES.\*

By F. FREMONT-SMITH, A.B., M.D.,  
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It has been accepted by the profession, until very recent years, that the treatment of diabetes was satisfactory which reduced the sugar output to a moderate percentage, prevented much acidosis, neuritis, subjective symptoms and escaped coma. Only of late has any physician suspected an ideal treatment with the highest result, as distantly possible. That *extraordinary* benefits to the organism could come from continued absence of urinary sugar, or that the hope might be entertained of practically continuous aglycosuric conditions, with possible absolute cure, was scarcely conceivable.

Once, however, the idea is established, that nearly every patient can be made sugar-free and kept so, while following a definite plan of diet, the interest and enthusiasm of both doctor and patient, and the self-education and co-operation of patient are inevitable.

Guelpa read a notable paper before the British Medical Association in July, 1910, entitled "Starvation and Purgation in the Relief of Disease," recently reviewed by Kellogg. This article maintained that diabetes mellitus is due to auto-intoxication from intestinal putrefaction, which has never been proven, reporting many cases made sugar-free in short periods of time by frequent starvations; usually accomplishing this in two or three days, and demonstrating that repeated fasting periods caused in some instances permanent aglycosuria.

Bardet later stated, before the Société de Médecine, that Guelpa's discovery had "completely upset established ideas" as to diabetes. Guelpa also reduced carbohydrates and proteins and eliminated the dread of acidosis and coma for fasting diabetics. He changed intestinal flora (which has been proved), reduced arterial tension, relieved neuritis, and improved the general health.

Fasting, which in normal man produces acidosis, has no such influence in the glycosuria, excepting in very rare instances, as lately pointed out by Stillman. In the "green diet," von Noorden and Naunyn had earlier recognized the same principle, but had not emphasized the idea or employed it successfully. Allen has scientifically demonstrated it by animal and human experimentation. In 1914 he reported results in depancreatized animals, the ducts remaining *in situ*, along with the small portion of retained pancreas, producing at will, by diet, all stages of diabetes. In his produced mild cases, by re-

\* Read before the American Climatological and Clinical Association, Washington, D. C., May 10, 1916. Congress American Physicians and Surgeons.

striction of carbohydrates and proteins, subsequent to a day or two of fasting, he kept the animals sugar-free indefinitely, though they lost some weight, retaining, however, both strength and activity.

In more severe induced cases, where the fast was prolonged to a week or more, and the diet greatly reduced for the purpose of depressing metabolism, return to increase in weight and metabolism were accompanied by a recurrence of sugar; persistence of sugar tolerance *reduced* carbohydrate tolerance, and repeated fasting periods *increased* it. Prevention of glycosuria reduces the weight for a period, and abolishes ketonuria; later, on a similar diet, weight increases without acidosis and without injury to the islands of Langerhans. Absence of urinary sugar ketones and of hyperglycemia increases tolerance for carbohydrates and protects internal secretion of ductless glands, especially of the pancreas and of the pars intermedia of the hypophysis and probably decrease of kidney permeability.

Stillman, in an illuminating paper very recently published, has further analyzed glycosurias with reference to that most dangerous complication, acidosis. Modern treatment has attempted control of acidosis on the discarded theory of von Noorden, that "fats burn in the fuel of carbohydrates." As Stillman has noted, rational treatment of glycosuria has been retarded by the accepted idea, that "over-feeding with fat is harmless, and even beneficial, and that carbohydrate feeding is required to avert threatening coma."

Excess of fat frequently *predisposes* to acidosis as shown in a case under my care during the present season, whose diet on February 16th consisted of protein, 239 calories; fat, 1388 calories; carbohydrate, 237 calories, with sugar output of 80.5 grams in 24 hours, and urinary ammonia, 1.696, more than five times the normal. On the following day the protein was reduced from 239 to 98 calories; the fat from 1388 to 200 calories, and the carbohydrate from 237 to 142 calories, the greatest relative reduction being in fats. The result on the fifth day of this reduction was a fall of sugar to zero and of ammonia to normal, after which protein and carbohydrate were gradually increased, with fats to about one-half the original quantity, without development of sugar or increase of ammonia above normal.

Stettin's success with cases incipiently surgical, in preventing advanced complications leading towards amputations, was due first, to exact and skillful medical direction, and second to the most painstaking surgical care. It is a *duty* to call a competent surgeon at the very first sign of infection of any sort, especially of the lower extremities. Joslin notes that diabetics live for years on an atrocious diet, untreated, without developing coma, until they are advised by some inexperienced medico, greatly to increase the fats or decrease carbohydrates, when coma promptly supervenes. Acidosis is not a product

of carbohydrates, but develops from fats and protein, sudden change of which above or below the customary amount, often in these long standing cases, acts like poison. Patients tending toward acidosis should at first be deprived of fats, and its introduction to the diet be made very gradually, since, though a valuable food, it cannot be metabolized until the system becomes adjusted to its use. Prior to fasting, in such cases, Joslin wisely advised the *not common* plan of eliminating fat for some days from the dietary; then cutting out proteins, a factor of somewhat lesser moment for development of acidosis, but quite important enough. Reduce now quickly carbohydrates, halving each day, for three days, and proceed to hunger days with graduated return to prescribed diet. Infectious cases, while fasting, should not be deprived of sodium chloride and should have abundant water, and if there be a tendency toward coma and vomiting, normal saline solution, per colon, should be constantly introduced by the Murphy method or by hypodermoclysis of salt solution. Small rather than large amounts of sodium bicarbonate are most efficient, half an ounce or less in 24 hours being usually sufficient; frequently *none* is required in the treatment of acidosis. Intravenous injection has been discarded.

Control of sugar, important as it is, becomes subordinate to the *control of acidosis*, which is associated with decreased blood alkalinity to the point of subnormal. Accumulation of hemic acids, as pointed out by Stillman, neutralizes a portion of the normal sodium bicarbonate of the blood and, when advanced in an exaggerated degree, produces death. *Reduced excretion of acids, or excessive production* is equally destructive of tolerance. Fruits, as noted by many physiologists, notably Bunge and by Sherman, increase hemic alkalinity by the introduction of easily assimilable alkaline bases.

Acidosis may be determined by urinalysis when excretion is not impaired, but increased production requires more elaborate tests. For determining over-production, for faulty elimination due to decreased kidney permeability, the direct method of Van Slyke, from the blood, admits of estimation of acid retention, as compared with urinary excretion, and adds valuable data for prognosis and treatment, as also does the use of Haldane's apparatus, both, however, requiring considerable training for exactness.

Stillman divides fasting glycosurias, as regards acidosis, into four groups, and shows that the same individual may react, at different fasting periods, in an entirely different manner.

Group 1 represents cases with normal hemic bicarbonate retention throughout, i.e., no acidosis, these being a good percentage of all cases.

2. Cases which under fasting recover from acid intoxication, even though at the verge of coma, which are less frequently observed.

3. Those cases showing low acidosis, indicated

by persistently diminished bicarbonate reserve in the blood, and increased ammonia secretion.

4. Such rare cases as develop acidosis while fasting, though previously free.

Sydenham and Rollo many years ago demonstrated that diabetes are made sugar-free by an exclusively flesh diet, and, until Mosse determined that a wholly meat and fat diet induced coma, such continued to be the approved treatment. Bouchard, studying auto-intoxication, showed that the feces of meat-fed animals were intensely toxic, as compared with vegetable eaters; as also did Hertter. The bacteria of meat are putrefactive in type; proteolytic organisms, producing ptomaines and toxæmia. Putrefactive changes in the colon, of the residue of flesh, tend to irritation of the colon mucosa or to ulceration, and to non-resistance of the colon membrane to the absorption of toxins.

Falta states that "much meat is injurious to diabetics," animal protein having a higher percentage of purin bodies than vegetable protein, and this observation is confirmed by Allen. Falta says that some glycosuria patients are more sensitive to protein than to carbohydrates.

Graham Lusk, in a paper read before the New York Academy of Medicine within the month, gives as his opinion, as the result of observation and experimental work, that 4 or 5 grams of nitrogen, i.e., 25 to 30 grams of protein in 24 hours, is sufficient for body needs in health, for the average weight adult and *practically all* that will be appropriated.

Von Noorden recognizes that a period of restricted diet, such as green vegetable days, raises the tolerance for carbohydrates "provided no meat be given with them."

Klempner, in cases of acidosis, advises vegetable days, followed by carbohydrates, with butter and eggs "but no meat whatever." He says "meat spoils the results; even eggs may do so; vegetable albumen is well borne." The albumen of eggs in a small proportion of subjects, in any condition of health, produces a condition simulating anaphylaxis.

Naunyn finds the benefits of "hunger days," or vegetable days, are dependent upon the exclusion of meat, and says "the general benefit attaching to all 'grain cures' is the exclusion of . . . harmful foods such as meat."

In Allen's judgment much of the benefit of the *oat diet* is due to the complete withdrawal of meat, in which conclusion Chittenden, Combe, Folin, Fisher and many others agree.

Physiologists demonstrate that the function of protein is to replace wear of living tissues; that of carbohydrates, by their combustion, to maintain heat and muscular activity. As Kellogg aptly says, "Carbohydrate is the coal, while protein is the metal repair for the machinery."

I have, however, observed a patient for four months, who had been meat-free for two years, with gradually increased tolerance for carbohydrates, and reduction of sugar output to zero, who experiment-

ally ate for one month, along with vegetable protein, 250 calories daily of chicken and bacon, without return of glycosuria or acidosis, although the case had been one of a most obstinate character. In this exceptional instance, appetite was lost for exclusively vegetable foods, and regained only by the addition of a modest amount of flesh diet. This case illustrates well, effects of nervous strain upon the delicately poised glycosuric, as a week in New York, required by illness in her family, and consequent emotional stress, without change of diet—returned with sugar, from a daily output of zero, when patient left the institution, to 46½ grams; ammonia increased from normal to great excess; on return, under normal mental conditions, in three days sugar was down to 6 grams, ammonia normal. One must recognize, that in this case mentioned, tolerance had been established and health restored by low fats and moderate proteins, by regular "hunger days" followed on each occasion by two "green days" and slow return to moderate carbohydrate content. The sound maxim of Virgil, "in medio tutissimus ibis," requires much caution and judgment in application to determine what is the middle course in which you will go safest, since that which is the middle course at one stage of any case, may be an extreme course at another. As in all other treatment of disease, hard and fast rules fail in diabetes, since one must in reason consider, not only the chemistry of the patient, but also the human element of psychological co-operation and physical appetite.

Benedict and Joslin have independently proved that the most advanced cases of diabetes retain some degree of power to burn carbohydrates. Joslin had no death in a mixed group of diabetes in 350 days, under more or less prolonged intermittent fasting treatment, and has found among 912 cases, in which the immediate causes of death have been varied, 64% were associated with coma; he states that coma can nearly always be foreseen and prevented by watching for acidosis, since the basic disease, diabetes, is chronic in character, and offers ample warnings to that medical attendant, who is observant and wary. Ether anesthesia would wisely be avoided; especially is the danger of coma increased in persons past fifty years of age, on account of impairment of kidney elimination; *general or acute local infections* often add the final factor, precipitating coma. Speaking of infections of the legs, such as slowly advancing gangrene, Joslin deprecates delay in active treatment and says: "handicapped by a lingering infection, which only too often is allowed to continue for months, with kidneys less efficient for throwing off the acidosis attack; deprived of exercise—that recently proven stimulus to sugar consumption—these pitiful cases frequently meet a fourth enemy in ether anesthesia; and is it any wonder that a formerly innocent disease becomes virulent, and the victim dies of coma?"

Attention has recently been called, in persons developing coma, to a new sign, i.e., the rapid decrease of intraocular tension, this lowered eye

tension running with equal pace the advance or recession of coma.

Since the diabetic fails to a greater or less extent to metabolize starch and sugar and, since his ability to convert these into fat, or to elaborate *any* form of food to the extent of one with healthy tissues, is impaired, it is apparent that he must restrict both amount and quality of food below that taken in health by one of similar weight and height, and must restrict his exercise or work in proportion. The limitation of carbohydrate will be determined from time to time by the glycemia and presence of sugar in the urine. Hyperglycemia and urinary sugar do not run *pari passu*, since permeability of kidneys to sugar differs in different patients and at different times.

One-tenth per cent. glycemia being normal, I have lately seen at the Sanitarium a patient whose hyperglycemia was 345%, or nearly 3½ times normal, who was exerting *only*.72 grams, less than a gram of sugar in urine of 24 hours; a second with blood sugar .357% practically the same, exerting daily 98 grams of sugar; in the first case noted, the sugar fell to zero on the third day of treatment, and the glycemia in 14 days was reduced from .354 to .122, i.e., within normal limits and nearly 3 times less than at the beginning of treatment a fortnight earlier. Others I have observed with normal glycaemia exhibiting glycosuria of from 10 to 20 grams daily, this difference manifestly depending upon some cause which is, as far as at present known, a varying permeability of kidneys to blood sugar. Here we might mention also cases known as emotional glycosuria, where apparently over-stimulation of the vagus disturbs the normal balance of internal secretions; some of these cases can rightly be classed among vagotonia.

The system requires, even in diabetes, about 50 grams (200 calories) of carbohydrates daily; the average man takes six or eight times this amount. The carbohydrate increase, conveniently measured in calories, must be begun at this low point and gradually raised, the rate being dependent upon (first) hyperglycemia and (second) the appearance of glycosuria. Kellogg's graduated tables, based upon body weight, in use at the Battle Creek Sanitarium, reckoned upon standards of Chittenden, Lusk and Folin, are a very convenient practical guide for feeding carbohydrates, fats and proteins, increasing or decreasing each element as urinalysis indicates; as also are the diet cards employed by Folin, or Foster tables on a unit basis.

Lusk estimates the "base ration," i.e., the total intake for one at rest, to be 25 calories per kilo body weight, for maintenance of weight; thirty-five for one at labor. Thus in Kellogg's tables for the diabetic, for each pound of body weight one should give in calories, beginning with carbohydrate, .5 calories, protein 1.5 calories, fat .2 calories, and gradually increase, if sugar-free up to carbohydrate 4 calories, protein 1½ calories, and fat 10 calories per pound body weight daily,

for a patient of the weight of 130 pounds, reaching this intake at about the end of two weeks, varying as required by weight and results, representing total calories in 24 hours in ordinary cases illustrated thus:

	Calories per lb. body weight.	Calories
Carbohydrate .....	4	520
Protein .....	1½	195
Fat .....	10	1300
<hr/>		2,015

If we find in the table, taking a concrete example, that the percentage composition of beans is:

Protein .....	23.6 %
Fat .....	1.90%
Carbohydrate .....	55.00%

then percentage is transposed into calories by multiplying by the arbitrary coefficients 1.14 for protein and carbohydrate, and 2.5 for fat, the intake becoming

$$\begin{aligned} \text{Protein} &\dots 23.6 \times 1.14\% = 26.8 \text{ calories} \\ \text{Carbohydrate} &\dots 55.0 \times 1.14\% = 62.4 \quad " \\ \text{Fat} &\dots 2.56 \times 1.90\% = 5. \quad " \end{aligned}$$

or a shorter method, approximately correct, is to add  $\frac{1}{4}$  to the percentage of protein and carbohydrate and multiply fat by  $\frac{1}{2}$ , differing in total result but .2% of calories.

Fasting days are ordered weekly or less frequently, followed by two or three green vegetable days. Abundant water drinking is necessary and beneficial, even up to four quarts daily, and exercise should be graduated according to strength and results; the very weak should remain at rest, and the vigorous may with advantage be urged to moderate and slowly increasing work, since exercise increases metabolism in a normal manner. The bowel movement must be kept free by bulky vegetable food, which contains the subtle vitamines necessary to healthy metabolism and abundant cellulose, also by bran and paraffin oil, and the skin must be kept active by cold frictions, hot baths, or if under institutional treatment, by electric light baths and various other hydrotherapeutic means there obtainable. Personally, I find far greater difficulty in successful management in private than in institutional oversight, not only because dietary strictness is imperfect in private, but also because of the interference of family and friends, who, fearing loss of flesh, or fancied approach of weakness from increasing reductions and corrections of diet, disturb mental calm and confidence, and also because in properly conducted institutions the psychological effect upon new arrivals of improving patients, already under treatment, is an enormous aid to prompt interest and eager adoption of this newer dietary régime. Much detail is necessary in the successful care of the diabetic, but this treatment, once appreciated, becomes quickly simple, easily managed, and offers renewed courage and enthusiasm to both physician and the patient.

### Original Articles.

#### INSUFFICIENT OXYGEN SUPPLY AS A FACTOR IN DISEASE.

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In the training of physicians more emphasis should be laid on the practical aspects of physiology.<sup>1</sup>

The best evidences that the medical student does not receive adequate instruction in the practical aspects of this important subject are the primitive notions of physiology so frequently exhibited in the explanations of the mechanism of disease and the mode of action of different forms of treatment, given in our clinical journals. The abundance of such evidences sometimes suggests that the steady advance of physiology makes but little impression on practical medicine.

No better example of the failure of a fundamental physiological fact to impress itself on clinical medicine can be cited than the constant recrudescence of the myth of "insufficient oxygen supply," for over a century a favorite explanation of pathological symptoms. The belief in "insufficient oxygen supply" is based on an erroneous notion of the nature of metabolism, according to which the amount of oxidation is regulated by the respiration. The metabolic processes are sometimes compared with the blacksmith's fire, the lungs with the bellows; the intensity of the metabolism being attributed to the activity of the respiration.<sup>2</sup>

This notion is widespread. In the daily press it is reflected in the references to the relation between "correct breathing" and the "laws of health." It shows itself in the popular fallacy that in cold weather deep breathing is advisable because "deep breathing stimulates the metabolism and thereby develops heat."

But it is not confined to the laity. "The condition is due to products of insufficient oxygen supply" appears perennially in the clinical journals. Even in recent numbers of our leading clinical journals the dyspnea of heart disease is ascribed to products of incomplete oxidation,<sup>3</sup> and twice recently the notion has received favorable editorial comment in the *Journal of the American Medical Association*.<sup>4</sup> To cite one of the several similar passages in these papers:<sup>5</sup> "In the pure cardiac cases the dyspnea seems to depend on a slow or insufficient circulation, which results in a poor oxygenation of the tissues and may even cause a transient acidosis owing to the incomplete combustion of metabolic products."<sup>\*</sup>

\* Peabody does not claim originality for this notion; he attributes it to Porges, Leindörfer and Markovici,<sup>6</sup> to Beddoe and

One of the best known examples of this notion is the belief that gout and the "uric acid diathesis" are due to the accumulation of products—chiefly uric acid—of incomplete oxidation of protein.<sup>11</sup> This belief is one of the errors at the basis of the widely accepted hypotheses of Haig<sup>12</sup> concerning gout and many other diseases.

Liebig declares<sup>13</sup> that when people who suffer from uric acid concretions go to the country, they sometimes get, as a result of better oxygenation, concretions of oxalic acid—an oxidation product of uric acid; and that when they exercise and so absorb still more oxygen, the concretions are completely oxidized to carbon dioxide and water. Animals that drink much water, according to Liebig, excrete less uric acid than others; the water keeps the sparingly soluble uric acid in solution so that it becomes more completely oxidized to urea.

Many investigators have attributed symptoms in leukemia, chlorosis, and emphysema to the products of incomplete oxidation, believing that the symptoms result from decreased external or internal respiration respectively.<sup>14</sup>

The introduction of hypophosphites into medicine was due to the belief that phthisis is due to incomplete oxidation.<sup>15</sup> Phosphorus and its partly oxidized derivatives, the hypophosphites, were recommended in this disease in the belief that they attract oxygen to the tissues.

Nencki and Sieber<sup>16</sup> proposed to measure the oxidizing power of the body under different conditions by determining the amount of benzol that can be oxidized to phenol; and concluded, as a result of such experiments, that in leukemia there is a decreased power of oxidation, in anemia and chlorosis no change.

Examples might be multiplied<sup>17</sup>; but these few will suffice to illustrate the nature of the fallacy.

The source of the error is found in the writings of Lavoisier.

In 1777,<sup>18</sup> Lavoisier cited metabolism experiments which he had carried out on birds, to show that respiration results in a combination of the carbon of the blood with oxygen to form carbon dioxide; he concluded that the process is analogous to that which two years previously he had described as combustion. But in elaborating this theory twelve years later,<sup>19</sup> he laid the foundation of future error. He speaks of incomplete oxidation of digestive products as a possible cause of disease, and urges the use of purgatives to rid the body of such products; he attributes the fevers of hospitals and prisons to the insufficient oxidation resulting from the impure air. In the following year<sup>20</sup> he declared that the metabolism is more active, and more heat, there-

Pembrey,<sup>7</sup> and to Lewis and Barcroft.<sup>8</sup> And he thereby illustrates the manner in which a false notion—like a rumor—spreads, each repetition of the notion, as it becomes further removed from the facts, becoming more incorrect and yet more dogmatic. These authors, however, avoid stating any such hypothesis as Peabody attributes to them, and add: "Permit, in fact, state that the evidence is against such a hypothesis."

The hypothesis was, however, proposed by Pfleiderer in 1868.<sup>9</sup> Later, however (1872),<sup>10</sup> it was rejected and vigorously combated by him. But Peabody does not refer to this.

fore, formed in cold climates *because* the cold air is denser than warm air, and a greater amount of oxygen per unit of volume comes in contact with the surface of the lung.

But Lavoisier's writings contain also the germ of the truth.

In his communications of 1789, he states that, in spite of what should be expected, experiments with guinea pigs demonstrate that these animals take up the same amount of oxygen, and give off the same amount of carbon dioxide, whether they breathe pure oxygen or a mixture of oxygen and nitrogen. Lavoisier was already, therefore, on the right track. By 1789, he had overcome the technical difficulties of constructing apparatus for carrying out metabolism studies even in man; by 1791, one of his pupils, Seguin, had developed a method of measuring the amount of oxygen in a mixture of gases (measuring how much of the gas would combine with phosphorus<sup>20</sup>); and another pupil, Hassenfratz, by showing that the temperature in the lungs is no higher than elsewhere in the body, had corrected the erroneous notion that the oxidation takes place in the lungs. It is highly probable, therefore, that Lavoisier might soon have carried out experiments that would have anticipated a century of errors. But scientific work was interrupted by the French Revolution,<sup>‡</sup> and Lavoisier himself was executed early in 1794.

From the death of Lavoisier until 1866 there was but little change in views held by physiologists regarding oxidation. Certain investigators,—Regnault and Reiset<sup>21</sup> (1849), Müller<sup>22</sup> (1858),—as a result of experiments similar to those of Lavoisier, pointed out that the activity of the metabolism remains unaffected by the oxygen tension. But these experiments made little impression at the time.

Reform came from another quarter. Almost inextricably involved with the incorrect notion regarding the cause of oxidation was an incorrect idea concerning the place of oxidation. Oxidation was believed to take place, not in the tissues, but in the blood-stream. It was the gradual accumulation of data not in harmony with this latter belief, and indicating that oxidation takes place in the tissues, that led to a readjustment of the views regarding the cause of oxidation.

It is difficult to determine precisely who should be given credit for teaching us the truth regarding this matter. The question of the cause of oxidation and that of the place of oxidation—though two separate questions—are not clearly separated in the early discussions. The question arises not only: Who first taught the

<sup>†</sup> In 1789 Lavoisier demonstrated this apparatus to the members of the Academy, and in his communication described certain facts which he proposed to publish later a detailed description. In 1790 he again promised to describe this apparatus. I have searched for this promised report in probable places but have never been able to find it.

<sup>‡</sup> The memoirs of the French Academy for 1790 were not published until 1797. A new set starting with volume 1 began in that year. The intervening years are not represented. The Academy was suppressed in 1793.

truth as a matter of belief? but also: Who first experimentally established the facts upon which the truth could be based? The echoes of the fierce polemics of the '70's over these questions have not yet died out.<sup>§</sup>

In 1838, Müller stated clearly<sup>23</sup> that oxidation does not take place in the blood, but in the tissues; he believed, however, that the respiration is not the result, but the cause, of the oxidation. In 1844, Vierordt stated correctly the facts of internal respiration<sup>24</sup>: that oxidation takes place in the tissues; and that the blood transports oxygen to the tissues, and takes carbon dioxide away from the tissues. Experimental confirmation of these hypotheses was furnished by L. Meyer in 1857<sup>25</sup>; Meyer demonstrated that the blood transports both carbon dioxide and oxygen.\* A further confirmation of this theory was furnished in 1863,<sup>27</sup> when Panum showed that the amount of oxygen absorbed by dogs and the amount of carbon dioxide given off is not affected by the great loss of transporting power for oxygen which results from severe hemorrhage. In the subsequent polemics, these writers are given little credit; Pflüger, indeed, in 1868 rejected Meyer's conclusions.<sup>28</sup>

Voit was probably the first<sup>29</sup> (1866) to incline physiologists to the belief that respiration is not the cause of metabolism, but the result of the needs of the metabolism. He pointed out that the carbon dioxide eliminated is independent of the ventilation of the lungs.<sup>†</sup> In 1868 he showed that neither by section of the vagus, formation of a pneumothorax or by hemorrhage, whereby respiration is diminished, can the amount of oxygen taken up or the amount of carbon dioxide given off be influenced.<sup>31</sup> In 1869 he showed that in leukemia—a disease which was believed to be associated with diminished internal respiration—neither the oxygen intake nor the carbon dioxide output is affected.<sup>32</sup> In the same year, Senator searched in vain for evidence of incomplete oxidation in dogs, cats, and rabbits after binding the thorax tightly.<sup>34</sup> In 1870 and 1871, Voit<sup>35</sup> discussed the whole subject at great length and answered especially the objections of Liebig who was teaching the old view.

Hoppe-Seyler accepted the new theory almost from the beginning,<sup>36</sup> but did not feel that the experimental proof was complete until 1878.<sup>37</sup>

At first (1866-1868) Pflüger—who at this time was working on the gasometry of blood—vigorously opposed the new view.<sup>38</sup> In 1868<sup>39</sup> he stated: "No one will deny at the present day that oxygen is continuously used up in the blood-vessels," and described experiments of his own

<sup>\*</sup> One of Voit's pupils has recently assigned 1877 as the date of Pflüger's recognition of the truth;<sup>40</sup> whereas as early as 1872 Pflüger was disputing claims for priority with Voit.<sup>41</sup>

<sup>†</sup> Twenty years before, by means of a mercury pump, G. Meyer had extracted carbon dioxide and oxygen from both arterial and venous blood.

<sup>‡</sup> Confirmed also by later experiments.<sup>42</sup>

<sup>§</sup> Salkowski studied this problem, too, and could find no products of incomplete oxidation in the urine of patients with leukemia.<sup>43</sup>

and similar ones by Schmidt in Ludwig's laboratory, intended to demonstrate the presence in the blood, during suffocation, of products of incomplete oxidation. He declared, also, that dyspnea is due to products of incomplete oxidation.<sup>40</sup>

But Pflüger soon changed his opinion: he disproved his earlier findings of products of incomplete combustion in the blood, and, in 1872, rejected the old hypothesis,<sup>10</sup> going even so far as to assert that he had recognized and taught the correct theory even before Voit. In extra large type on page 46 of this paper occurs the following very important sentence which expresses the views of physiologists today: "Here lies (in the cell itself alone) the essential secret of the regulation of the oxygen used by the body; it is not determined by the blood pressure, the velocity of the blood stream, the activity of the heart, or the activity of the respiration."

In 1875, both Voit<sup>11</sup> and Pflüger<sup>42</sup> complain that the new view is not everywhere known and accepted; according to Voit, even Liebig still opposed it. But that the results are not everywhere ignored is shown by Voit's further complaint against those who say that they recognized and demonstrated the truth before he (Voit) did; he disputes especially Pflüger's priority claims.

During the years 1875 to 1878 a great many papers on respiration and metabolism appeared from Pflüger's laboratory.<sup>43</sup> Many of them are very long and offer as evidence not only experiments carried out in Pflüger's laboratory, but an enormous amount of other evidence from all departments of biology. His own experiments deal largely with measurements of the amount of metabolism under conditions of varying oxygen supply. The papers are polemic in character and their influence on other physiologists is reflected in the gradual change in the nature of discussion. The earlier papers are devoted to demonstrating that the opponents of the new view are wrong. Pflüger opposed<sup>44</sup> especially the contentions of Ludwig and his pupils<sup>45</sup> that oxidation in the muscles is proportional to the velocity of the blood, and that during suffocation the blood contains products of incomplete oxidation. He seems to have overcome opposition to the new view toward the end of this period, for later papers<sup>46</sup> are directed largely at those—in Hoppe-Seyler's laboratory especially<sup>37</sup>—who dispute his claims for priority. Physiologists commonly give Pflüger credit for first demonstrating the truth regarding oxidation. As a matter of fact, Voit first taught the truth; but Pflüger overcame opposition and convinced the scientific world.

With the opening of his new institute in 1878 Pflüger seems to have concluded his work on respiration and turned his attention to other problems. Judging by a statement from Hoppe-Seyler's laboratory at this time,<sup>37</sup> the new view seems to have gained general acceptance, Lud-

wig alone holding out; Ludwig apparently never accepted the new view.<sup>23</sup> (He died in 1895.)

But since 1878—long enough ago it would seem for the facts to have filtered into clinical medicine—no physiologist has contended that products of incomplete oxidation will result from either poor respiration or poor circulation. It is to be hoped that more active emphasis on the practical aspect of physiology will purge clinical medicine of ideas generally recognized by physiologists as incorrect.

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## ROENTGENTHERAPY IN HYPERSTROPHY OF THE THYMUS GLAND.\*

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In no line of recent medical research has greater interest been taken, nor more fruitful results obtained, than that pertaining to the ductless glands. Each of these organs by its separate action, and by its interrelation with others, has been shown to have effects upon the bodily economy which present a problem at once perplexing and fascinating to investigator and clinician alike. And some of the most interesting clinical questions centre about the thymus gland.

*Anatomy and Development.* In man the thymus develops as a paired organ from the ventral part of the third branchial cleft; at birth the organ lies behind the sternum, backward as far as the pericardium, reaching above somewhat higher than the jugular notch. Accessory lobes lying within the thyroid or closely united with it may develop from the fourth cleft. "The close association," says Noel Paton, "of such a structure with the original direct channel of the blood-flow to the body suggests the occurrence of some modification in the blood en route for the tissues." This statement should be borne in mind when discussing the clinical symptomatology of the gland.

It consists of two chief lobes, one on each side, and each subdivided into a number of small globules. Each lobule is surrounded by a fibrous capsule, and is densest at the periphery. The epithelial structure, of which the gland essentially consists, forms a branching network throughout the lobules, at some places concentrated into masses of cells, which degenerate into large, more or less circular bodies,—the so-

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called corpuscles of Hassall. They are invaded by polymorphonuclear leucocytes, and their protoplasm contains granules staining deeply with basic stains. The interstices of the epithelial groundwork are filled with lymphocyte-like cells, the nature of which is still under dispute, one school of writers asserting them to be true lymphocytes derived from outside, the others to be derived from the epithelial cells and hence really epithelial in nature. Upon this point depends, in large measure, the classification of the gland in its relation to the bodily economy, whether with the lymphatic apparatus, as was formerly supposed, or with the system of hormone producers. Without attempting to take sides in the controversy, it may be remarked that it is against these cells that the Roentgen-therapist in large measure directs his efforts, and that they react like other structures of known lymphatic character.

In man, as in most other animals, the thymus reaches its greatest size in relation to the body at the time of birth; thereafter it continues to grow, but at a reduced rate, growth ceasing only with the beginning of sexual maturity; it then atrophies, the essential tissue being replaced by fibrous tissue and fat, and is finally reduced to a mass of adipose tissue with a few islands of thymus remaining.

*Physiology.* That the secretion of the organ is essential to the normal development of infancy and early childhood seems definitely proven. Klose and Vogt,<sup>2</sup> by splitting the sternum, removed the thymus from 54 dogs. All the operated animals died in from three to seventeen months, after passing through certain definite stages. After a short latent period, characterized by ravenous appetite, they passed into a second stage of adiposity, in which they became heavier than their controls, with apathy and muscular weakness. Soon, however, the third stage of idiota thymica supervened, the animal becoming cachectic, clumsy, and stupid. A coma of several days followed, ending in death. The most important developmental variation in these thymectomized animals was found to lie in the small size of the skeleton and poverty of lime salts in the bones. The changes were those of osteoporosis and osteomalacia. In delayed ossification and diminished lime content they somewhat resembled rachitic change. The experimenters ascribed these conditions to a nucleinic acid intoxication, normally neutralized by thymus secretion.

The experiments of Svehla,<sup>3</sup> who by injection of watery thymus extract produced lowered blood pressure and eventual death in dogs, have been largely discounted by Popper<sup>4</sup> and other later workers, so that the effect of hyperthyroidism must be considered from the experimental standpoint is still unknown.

The interrelation of the thymus with other glands is beyond the scope of this paper. It is interesting in passing, however, to note its rela-

tion to the sexual organs. It had long been known by butchers that the thymus of castrated cattle was larger than that of bulls. Henderson, at the request of Noel Paton,<sup>5</sup> investigated this point. He found that the thymus of the castrated was nearly twice the size of that in uncastrated, and that its atrophy is delayed.

*Symptoms and Treatment.* In 1829 Kopp first described a disturbance of respiration due to persistent or enlarged thymus, which he ascribed to pressure upon the trachea. In 1858, however, Friedleben<sup>6</sup> stated very emphatically that "enlargement of the thymus is not to be considered as a cause of death." This pronouncement by so eminent an authority undoubtedly set back progress along this line for many years. In 1888, Grawitz reported two sudden deaths in infants, in which the autopsy disclosed an enlarged thymus. This was closely followed in 1890 by Paltau<sup>7</sup>'s description of the so-called "status lymphaticus," in which, he believed, though the thymus was enlarged in every case, the enlargement was not the cause of death. Hedinger,<sup>8</sup> however, in 18 autopsies on cases of thymus death, proved pressure in each case. Beneke<sup>9</sup> showed that the simple throwing back of the head was sufficient to produce pressure, and Jackson,<sup>10</sup> in 1907, demonstrated by bronchoscopy, direct pressure upon the trachea in a case of enlarged thymus without any accompanying signs of status lymphaticus. At about the same time Rehn,<sup>11</sup> by excising a piece of the gland and thus relieving the symptoms, proved them to originate from pressure. Not only may the thymus compress the right or left auricle, but by displacing the blood vessels cause irritation of the inferior laryngeal nerve, and thus cause spasm of the glottis, according to Crotti.<sup>12</sup> This, accordingly, is the view held by most observers today, despite some arguments for the internal secretion theory.

As seen in man, the pathology is practically always that of a simple hyperplasia. New growths occasionally occur, and congenital syphilis is believed by some to have a part.

The characteristic clinical syndrome of this affection is the so-called "thymic asthma,"—sudden severe attacks of dyspnea, stridor and suffocation. Most common in early infancy, it may occur as a sudden complication in other diseases in older children, in whom it may be a cause of sudden death. This latter condition is termed by D'Oelsnitz,<sup>13</sup> who first described it, as "latent hypertrophy of the thymus." Holtz<sup>14</sup> recognizes thymus hypertrophy as possible cause of convulsions in infants, without other signs. The dyspnea is of the expiratory type,—the stridor inspiratory. In many cases diagnosis can be made by percussion, the thymus presenting a roughly shield-shaped area of dullness, broadest above, and merging into the heart dullness below by an isthmus which varies in length and breadth according to the degree of hypertrophy.

Bulging of the upper part of the chest has also been observed.

Sylvester,<sup>15</sup> of Boston, makes a distinction between the symptoms of cyanosis, stridor, and slow, labored breathing, and those of breathing of the asthmatic type, characterized by fairly easy inspiration and long, difficult expiration accompanied by râles. The first syndrome he ascribes to pressure, the latter to hypersecretion of the thymus.

In differential diagnosis, incoördination of the vocal cords, malformation of the larynx, and when occurring some time after birth, enlarged bronchial glands, adenoids, and swallowed foreign bodies must be ruled out.

The diagnosis is usually best made from a good Roentgenogram, when the enlarged gland appears as a broadening of the upper mediastinal shadow to right or left, or both. An enlargement to the right may be due to other causes, but with broadening to the left, the diagnosis is reasonably certain.

Too much dependence, however, must not be placed on the x-ray. The "critical space of Grawitz," as that writer named the superior opening of the thorax, is in young infants less than 2 cm. in diameter, and a very slight antero-posterior enlargement of the gland in this region is sufficient to produce pressure on the trachea, esophagus, and all other structures which pass this point. Diagnosis in such cases, accordingly, must rest on the clinical symptoms.

The first method of treatment proposed was, naturally, surgical removal. The work of Rehn has already been mentioned. Later, resection of the manubrium was tried, and finally thymectomy. Andrews,<sup>16</sup> writing in 1913, claimed that simple ablation of the gland could be done without much risk. Parker's<sup>17</sup> report of 50 cases, however, published about the same time, showed a mortality of 33 1-3%. It is interesting to note the change of heart shown by Veau,<sup>18</sup> a French surgeon, who was a pioneer in the work and to whom were credited 11 of Parker's 50 cases. In 1912 he reported to the Paris Pediatric Society two cases of his own treated by the Roentgen method, and stated, "for over a year I have not done a thymectomy, and have not yet been disappointed in radiotherapy." It will presently be shown that the latter method obviates even the slight risk claimed by Andrews, and from a practical standpoint it must be admitted that consent to a non-surgical method is much more easily secured than for surgery on patients of such tender age.

The high percentage of mortality from surgical intervention, together with the known success of the Roentgen ray in destroying other structures of a lymphatic nature, induced a trial of this agent. The first case reported was that of Friedlander and Crane,<sup>19</sup> at Cincinnati in 1904. In 1907 Rudberg,<sup>20</sup> by experiments on animals, showed that it was possible to induce all grades of shrinking in the gland, up to the point

of complete fibrosis and destruction of all gland tissue, by action of the ray. Sidney Lange,<sup>21</sup> of Cincinnati, working independently at about the same time, confirmed these results, showed that it was possible to vary the rate of the atrophy by varying the intervals and intensity of the irradiation, and in 1910 he reported to the American Roentgen Ray Society a series of five cases successfully treated. Further confirmation was given the method by the report of Ribiedau's<sup>22</sup> case, in which, after intensive irradiation had caused the disappearance of the dyspneic symptoms within a few days. The child died later of measles; the autopsy showed fibrous atrophy of the thymus gland. Lange's last report, presented before the Roentgen Ray Society in 1913,<sup>23</sup> included 30 cases from his own and other clinics, in every one of which the application of the ray was followed by prompt and complete recovery. Among later case reports may be mentioned those of Sylvester<sup>15</sup> and of Morgan and Dachtler.<sup>23</sup>

The contrast of these excellent records with the one-third mortality of thymectomy would seem to be sufficient argument for Roentgen-therapy, but there is still further evidence to be cited. The objections raised by the advocates of surgical treatment are, first, that the slow action of the ray renders it unsuited for urgent cases, and second, that the gland tends to regenerate rapidly after involution produced by the ray. Rudberg, however, in his experiments already cited, found involution beginning 3½ hours after the first exposure. Lange, in at least one urgent case, was able to bring about a symptomatic cure by one massive treatment. His patient was in such condition that tracheotomy had been done prior to its admission into the hospital. He does not claim that the thymus under these circumstances has undergone complete involution, but simply that its size and function have been decreased sufficiently to tide the patient over a dangerous period. In the milder cases one massive application has produced a symptomatic cure.

The second objection, that of tendency to regeneration, can with justice be brought against surgical treatment as well. The serious results of complete thymectomy in animals have been chronicled. Parker, the advocate of surgical treatment already mentioned, gives as his opinion that the removal of small bits of the gland directly concerned in the production of pressure is as effective as that of larger portions. He believes further that complete thymectomy is practically impossible in the human being. In one of his own cases, regeneration to normal size followed a fairly complete thymectomy. Klose and Vogt's experiments on dogs showed complete thymectomy to be necessary to produce symptoms of thymus deprivation, and that if part of the gland were left, it promptly returned to its former size. The two methods of treatment thus stand on the same footing with re-

spect to regeneration, but if this occurs after Roentgentherapy it can readily be controlled by repetition of the treatment.

The possibilities of this method of treatment will doubtless be found to increase as our experience with it grows. It is believed by many that there is a connection between enlargement of the thymus, adenoids, and hypertrophied tonsils, and the thymus condition may well be as common as the other two. The irradiation of all suspicious cases might save them from death under an anesthetic or intercurrent infection occurring before the third year, at which time spontaneous relief usually occurs. Even the acute symptoms may not be manifest in every case. The thymus is always a potential source of danger and possible cause of death.

The interrelation of enlarged thymus and hyperthyroidism is now pretty generally recognized. Autopsies on cases of Graves' disease show enlarged thymus in 75%, and in the cases dying after operation the proportion was found at Munich to be even higher. The exact rôle played by the thymus, whether a causal factor or a direct cause of death remains to be worked out. Hector McKenzie, quoted by Parker, found the thymus enlarged in all his cases of Graves' disease that came to autopsy, and suggests that possibly every case in which there is a thymus persisting into adult life is one of potential or latent Graves' disease. For some years the Mayo clinic, among others, has used preoperative irradiation on their cases of exophthalmic goitre, and it may well be that the beneficial effects have been due to the action of the rays on the thymus instead of the thyroid. As an example of thymus hypertrophy in adult life, Lange quotes the case of a woman of 35, suffering for one year with palpitation and choking sensations, increasing so that swallowing and breathing became difficult. X-ray examination disclosed what was believed to be an enlarged thymus. One massive treatment gave relief, after which improvement was progressive.

The excellent article of Lange has already been liberally drawn upon in the preparation of this paper. His deductions, however, are so well-phrased that I shall venture to quote them in conclusion:

1. Roentgen irradiation of the thymus produces artificial involution of the gland.

2. X-ray therapy is the method of choice in cases of enlarged thymus in children, whether the symptoms be mild or urgent.

3. Urgent cases should receive repeated massive doses.

4. Recurrences due to regeneration of the gland are to be watched for and controlled by further treatment.

5. Children whose physical or mental development is retarded should, if suspicion is directed toward the thymus, receive tentative x-ray

treatment, even though a positive diagnosis cannot be established.

6. X-ray therapy as a precautionary measure, or preoperative treatment may enable children of the so-called lymphatic type to withstand intercurrent disease or anesthetics, which would otherwise prove fatal.

7. Pre-operative exposure of older children and adults, where there is a suspicion of enlarged thymus, might lessen operative mortality.

8. Routine pre-operative x-ray treatment in cases of hyperthyroidism should be resorted to with a view to lessening operative mortality.

9. X-ray exposure of the thymus gland has been proven harmless, whether in normal or abnormal individuals. A therapeutic test with the x-ray is, therefore, always permissible.

#### REPORT OF PERSONAL CASES.

CASE 1. Boy aged ten weeks. Born after normal labor. When ten days old had sudden attack of dyspnea and collapse, which recurred frequently at intervals of a few days, and rendered the constant presence of two nurses necessary. X-ray examination was inconclusive, but on the basis of clinical symptoms Roentgentherapy was decided on. Five treatments were given at five-day intervals. After the first exposure the suffocative attacks ceased and the child began to develop normally. At the age of eight months adenoids were removed under light anesthesia, with complete success.

CASE 2. Boy aged 20 months. Weight at birth,  $7\frac{1}{4}$  lbs, at 1 year  $24\frac{1}{2}$  lbs. The nurse who attended him at birth states that for the first few days the child was constantly troubled with accumulation of mucus in the throat, requiring much attention. Thereafter he developed rapidly and had no sickness during first year. During the fall of 1914 he began to catch cold easily and often. This was noticeable as he had been so free from colds during his first year. He developed a spasmodic cough, so that whooping cough was at first suspected. This cough and a wheezy asthmatic breathing continued throughout the winter. At times it seemed to be controlled by full doses of belladonna. In January, 1915, adenoids were removed, without marked benefit. He was then sent to Atlantic City to see if the change of air would help him. It did not. Dr. Hollingshead, of Philadelphia, then suggested a Roentgenogram.

X-ray examination by Dr. W. S. Newcomet of Philadelphia revealed enlarged thymus, also marked enlargement of right pulmonary hilus shadow. Von Pirquet test positive. X-ray treatment was ineffective until the dosage was increased, when improvement began. A Roentgenogram taken after three months shows marked diminution of thymus shadow. This child's general condition continues to improve, and he has no severe suffocative attacks. At times, however, stridor and dyspnea reappear in some degree, and an occasional treatment is given. In a personal conversation with the writer, Dr. Newcomet stated that he considered this case to be one of the so-called "glandular babies," and advised vigorous raying over large areas of the chest. This advice is now being followed.

CASE 3. This case is reported for what it is worth; the striking result being sufficient justification. The patient was a boy aged three days. Born after normal labor, he had a violent convulsion when only a few minutes old, and these continued at the rate of five or six daily. Prominence of the upper portion of the chest suggested the possibility of enlarged thymus as the causative agent. The child was brought for examination at 7.30 p.m., having had a convolution at 5. It was very weak and ap-

peared to be nearly in extremis. Roentgenograms, rather hastily taken on account of the child's condition, showed a suspicious shadow in the upper mediastinal region. A treatment as vigorous as seemed safe was at once given. The child rested well that night; at 5 a.m. the next day had a little twitching of the eyelids but no convolution. Began to nurse normally. Three treatments were given at three-day intervals. No more convulsions occurred and the child at once began to develop in a normal way, which improvement has continued to the present,—6 weeks after the last treatment.

Dosage varies so much that discussion of the subject was purposely omitted. It should be begun lightly and increased if results do not follow. The writer's average has been from two to three minutes with a hard ray, filtered thru aluminum.

The writer's thanks are due to Dr. Maynard Ladd of Boston, Drs. G. M. Albee, M. Lincoln and A. W. Marsh of Worcester for the privilege of reporting the cases here cited.



CASE II.—Dr. Newcomet's plate before treatment, showing enlargement of thymus and hilus shadows.

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#### DISCUSSION.

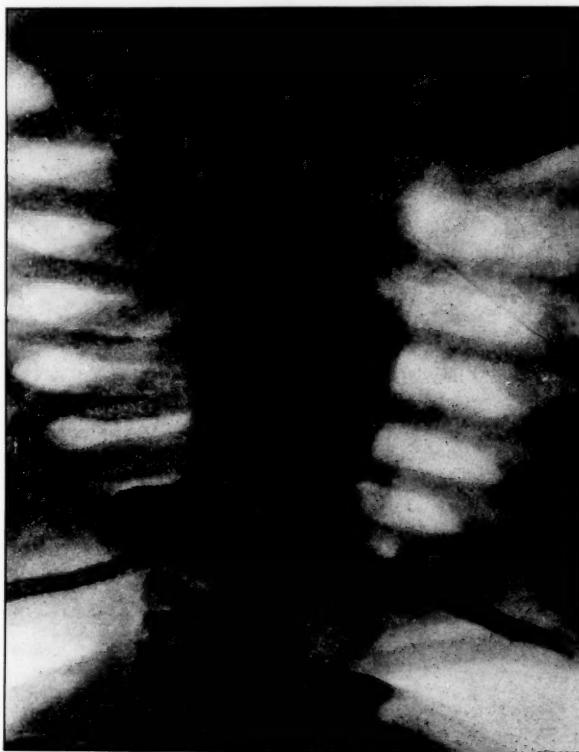
**MERRICK LINCOLN, M.D., Worcester:** Dr. Cook has given a most interesting paper on a condition which is perhaps commoner than we have thought, and which is more important than we have heretofore realized. My personal experience with thymic asthma is small. It is a part of, though a special aspect of, the general subject of child asthma which was given me to discuss.

I think we must go back of the term asthma, which, after all, is only a symptom, and try to

find the general condition behind it if we are to get anywhere. In looking around, one of the general conditions which we run across is the so-called lymphatic constitution and this is what I first want to discuss in its relation to asthma.

Three states of childhood are spoken of together, namely, the lymphatic constitution, neuro-arthritis and exudative diathesis. Whether they are entirely different conditions or different manifestations depending on the pre-

and a sensitiveness of the respiratory mucous membranes. Many other symptoms are often present, such as an intermittent fever, chills, perspiration, adenoids and swelling of the tonsils and glands of the throat, jaw and neck, anemia, pseudo-hypertrophy of the heart with palpitation or arrhythmic pulse; a tender skin, urticaria, intertrigo, crusts on the face and scalp, eczema; coryza, hay fever, laryngitis, diffuse tracheo-bronchitis, bronchiolitis and bronchial



CASE II.—After treatment. Showing diminution in thymus shadow.

dominating symptoms of the same condition is not clear, but probably if the latter is not true then at least they stand in close relation to each other. We differentiate the pastous or lymphatic anemic habitus with hypoplasia of the lymphatic system and a stupid temperament; the erethic or neuro-arthritis habitus, restless and irritable with tender skin, and rather precocious intelligence, and the plethoric obese habitus, babies of tremendous adipose tissue. The general signs and symptoms are a hyperplasia of the lymphatic system, a sensitiveness of the skin,

asthma; a coated tongue, geographical tongue, habitual constipation with muco-membranous enteritis and cyclic vomiting. This is only a partial list of the symptoms and as these symptoms go with other conditions, it shows the complications and uncertainty of their relations.

On one extreme we have the predominating lymphatic type, and it is probable that so-called lymphatism or status thymico-lymphaticus with hypertrophied lymphoid tissue, enlarged spleen and thymus, with tendency to sudden death is the same condition. If to this we add one of

the prominent symptoms of the exudative diathesis, namely asthma, then we may find a condition closely related to the so-called thymic asthma just brought to your attention. Second is the prominent group with eczema predominating, and third the group with asthma. It may not be necessary that the connecting link between these be a demonstrable pathological lesion of the lymphatic tissue. There may be a biochemical relation. Pfaunder stated several years ago that the diet had a marked effect on causing these conditions, while digestive disturbances are common. To quote him, "Is it not possible that under certain conditions (an unfavorable predisposition as to the function of intestinal and cellular digestion) foodstuffs digested into the gastro-intestinal tract might act in the body like an antigen; if this should be the case, then it would be quite natural to assume that the lymphatic diathesis represents a kind of food allergy (food anaphylaxis)."

Schloss in 1912 showed that egg poisoning in children is a form of anaphylaxis. It is well known that eczema is made worse by excess of fats and carbohydrates, but some recent work goes to show that proteids often are an exciting cause. To come directly now to the question of child asthma, it has just been shown that certain proteids may bring on in a child so predisposed typical attacks of bronchial asthma. It seems to me that this subject of proteid anaphylaxis or sensitiveness to proteids is being widely opened up, and that we are at a point of view of great importance. Whether there is any relation between lymphatism and proteid anaphylaxis is a very open question. Talbot has studied infants in relation to proteid anaphylaxis to asthma. The sensitization apparently takes place either by the unchanged proteid passing directly into the blood through the intestinal mucous membrane in the earliest weeks of life, or through the injured intestinal mucous membrane in later infancy during some digestive upset as diarrhoea. There may be also an inherited sensitiveness. The infants are tested by scarifying the skin and rubbing in the suspected proteid. Several foods may be tested at once on as many scarifications. Egg white, various kinds of meats, beef juice, milk for the casein, various grains such as barley and oat meal for the gluten, etc., are used. Within 15 minutes a small wheal or an erythema arises where the causative proteid was inoculated. Talbot has found that various proteids are the factors in many cases of child asthma, egg being the commonest cause. After the egg is found to be a cause, the asthma ceases on withdrawing the egg from the diet. This, of course, is a most inconvenient procedure, so he has attempted to accustom the child to egg by starting with one milligram doses of egg albumen in capsule by mouth, with increasing amounts, and he has met with success which is, however, if not complete, encouraging.

My personal experience is rather limited. One

child with an idiosyncrasy to egg, manifested by urticaria and eczema, had a typical attack of bronchial asthma. Attempts to immunize her brought on oedema with the third milligram dose of egg albumen. Another older boy had partial relief from his asthma when beef, to which he reacted, was withdrawn from his diet. The most striking case was a child of a year of age. At nine months she had had a good deal of mucus in her movements so at this time she may have become sensitized. About every three weeks she would have an unaccountable attack of mucous colitis and either asthmatic bronchitis or asthma. It took several attacks before we realized the attacks were true asthma and not primarily recurrent infections of the bronchial mucous membranes. Attempts at regulation of the diet were unavailing, for apparently what agreed with her at one time did not at another. Finally, by testing the skin with all foods she was taking that contained proteid, it was found that her troubles were due to beef juice. After withdrawal of this she had practically no more asthma, although she had a few more attacks of mucous colitis due to an apparent sensitiveness to milk proteid. But after her diet became more varied she showed marked improvement in this condition also. Here it seemed that it took the accumulation of two or three weeks of daily portions of beef juice before sufficient poison was at hand to bring on an attack, a condition somewhat different from the egg cases where perhaps one morsel of food containing egg may bring on asthma.

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#### GUILLAUME DUPUYTREN, 1777-1835.

BY WILLIAM PEARCE COUES, M.D., BOSTON.

It has been said with truth, that if a physician in America wished to do research work on some subject he was especially interested in, that he could not go far in his researches without finding that it had all been done before by a German. I would change the saying some-

what as regards surgery at least, and say that if there was any modern surgeon especially interested in certain pet theories and principles, seemingly of modern times, that if he would but look back he would find that much of the work had been done by a Frenchman nearly a hundred years ago, and that Frenchman was Guillaume Dupuytren.

In the present age of telephones, motor cars, and dictographs, not to speak of the many instruments of precision at the service of medical men, to make their work easier and more exact, it is wise to look back and see what was accomplished by the great men of the early part of the last century, without these aids to our science.

Among the names of the many great French surgeons of the last century, that of Dupuytren stands first. In France the mutterings and rumblings of the great storm that was soon to break in the form of the Revolution, were growing louder and more insistent at the time of the birth of Dupuytren in 1777. Is it a coincidence that so many of the great medical men of France, hardly any of them from the aristocracy, were born at about this time? Malgaigne, Velpeau, Roux, Larrey, Dupuytren,—what names for a nation to be proud of and cherish! A study of the lives of such men as these leaves no room for doubt as to the cause of the wonderful powers of France, in her hour of need in the present great European struggle.

Guillaume Dupuytren was born at Pierre-Buffière, a town of Haute-Vienne, on October 5, 1777. (Some authorities give October 5, 1778.) His father was an advocate of very limited means, and though some accounts tell us of medical forbears, nothing definite is stated concerning this question. History tells us that, as a boy, Dupuytren was of more than ordinary attractive appearance and charm, and it is pretty definite that on account of this unusual personal attraction, he was kidnapped, when of tender age, by a rich lady of Toulouse; he was, however, returned to his family in a short time. In 1789, a cavalry officer who was stationed at Pierre-Bouffière took a great fancy to the boy and it did not take a great amount of urging to obtain the permission of the elder Dupuytren to allow the boy to accompany him to Paris. On arrival at Paris, he was sent to the College of La Marche, which was directed by Monsieur Coësnon, a brother of the officer. It was said that the young student particularly distinguished himself in philosophy while there, but from the evidence at our disposal, it seems that he was not in the least the "goody" type of boy, and got into all the scrapes and troubles that a normal boy should.

At about the time that the Revolution came to an end, Dupuytren was old enough to think of his definite career in life, and unhesitatingly chose the profession of medicine. He was hardly eighteen years old when he was chosen prosec-

tor at the École de Médecine, and in 1801 he was promoted to the position of "Chef de Travaux Anatomiques." We know that about this time he also paid great attention to the study of physiology and pathology, and this, as will be seen later, was of lasting value to him in his later work. In 1804, Dupuytren obtained one of the positions he had been striving for, and was appointed surgeon of the second class at the Hotel Dieu, where almost all of his work was done.

Malgaigne tells us some interesting anecdotes of the early days of Dupuytren in Paris, and apparently it was against his parents' wish that he stayed there. We know that his requests for money to keep on with his work were not granted by his parents. In his early struggles, which were almost unbelievably hard, like Velpeau's and Malgaigne's, he received a call one day from that great philosopher, Saint-Simon, who had become interested in the boy, probably on account of his bent for philosophy. He found Dupuytren working in bed on account of the cold, and other signs of abject poverty could not fail to be read. After a brief visit, Saint-Simon departed leaving a roll of bills amounting to two hundred francs on the barren mantel. Dupuytren soon saw the money, dressed quickly, and was soon at the house of Saint-Simon with it. He found the great man at home and said, "Here is something you forgot at my house." Saint-Simon could not tell the poor student the truth, and so after a moment said, "Yes, I forgot them."

The years that followed were indeed hard ones, probably no present day physician can form any conception of them. Much of the latter day bitterness and reserve of the great surgeon was undoubtedly on account of the indelible impress of the terrible times through which he passed in his youth. At one time, during his early life in Paris, his funds got so low that he had to subsist on bread and cheese for six weeks, but his determination to surmount all obstacles made him suffer all and endure all with fixed determination. It was at this time that he used the fat of the subjects in the dissecting room to make oil, with which to light his poor lamp. It might be said that fat, a substance abhorred by all dissectionists, was never used to better purpose.

Stories conflict as to the exact facts regarding Dupuytren's first appointment at the Hotel Dieu, but there is no question as to the exceedingly bitter struggle for the place between Dupuytren and Roux. One story is that there was a *concours* for the place of third surgeon, a position that had never been existent until this time, and it was supposed by some that this was created expressly for Dupuytren, whose great operative skill was just beginning to be recognized. Roux determined to contest the position, and his examination proved to be equally good with that of Dupuytren. The de-

cision was postponed, and the candidates required to go through more tests, and to deliver in public a thesis, the subject of which was not to be known until four hours before the public discourse. Dupuytren was successful, and it has been said that he had prior knowledge of the subject of the discourse to Roux. Judged from our study of Dupuytren's life, this does not seem probable; at all events, Roux later admitted that he was too young for the position at the time he tried for it. This occurrence was the starting point of a bitter feud between the two men, which was to last for many years. Later in life Dupuytren and Roux fell in love with the same young woman, and Dupuytren again carried off the prize.

In the year 1805, Dupuytren was attached to the service of Boyer at the Hotel Dieu, and he was claimed by the army to do his work as a conscript. He was, however, so much wanted at the hospital, that the Ecole de Médecine, at a special session of the faculty, pleaded an exemption for him which was granted. In 1808, he was appointed adjutant at the Hotel Dieu, under Pelletan, a surgeon of the old school, of somewhat *laissez faire* principles. Some of the most interesting and important events in Dupuytren's life occurred at this time, of which Malgaigne tells us in a most graphic way. A word concerning the Hotel Dieu, for which Dupuytren did so much, will be of interest, for here the great surgeon lived and worked almost constantly, for thirty years.

The Hotel Dieu was founded by nuns in 660 A.D., and has been in existence uninterruptedly ever since, 1256 years. For years it was a hospice for the poor and destitute, as well as the sick, and many of the poor of Paris found refuge there during the long, cold winters. The overcrowding, disease, and general misery were too frightful to be described. In the times of epidemics the very high mortality was greatly increased. Some things had been changed for the better before Dupuytren's time, but the mortality was still very high, and there was great over crowding. Dupuytren changed all this and made order out of chaos. At this time there were 1000 beds, and fifteen wards, but five of these were surgical. There were 264 surgical beds, 191 for men and 73 for women. Dupuytren gave two of his wards to Breschet and Sanson, respectively, keeping 113 beds on his service. Fourteen hundred ward cases (surgical) were treated in 1829. In the old days five or six patients lay in one enormous bed or *charnier*.

Such was the Hotel Dieu, where Dupuytren's famous lectures were delivered, the wonderful "Leçons Orales," which thrilled countless audiences.

Dupuytren worked with all his energy while under Pelletan, and, studying the ward cases with minute care, soon had his lazy chief at his mercy, regarding all questions of diagnosis and operative procedure. Malgaigne tells us that

Pelletan, as chief of the service, had the right to assist at all operations he gave his subordinate, and he, in turn, had the right to visit all patients in the ward, after his chief. Dupuytren would tear to shreds with merciless logic all the fanciful diagnoses of his chief in the presence of the students. He was in his turn mercilessly criticised, but his critics, conscious of his great ability, were obliged to find other things to complain of than his operative skill. Thus Perey named him the first of surgeons and the last of men, and Lisfranc, the "Brigand of the Hotel Dieu."

It so happened that Pelletan wished to have his nephew appointed in his place at the Hotel Dieu when the time came, instead of Dupuytren, and as Dupuytren's whole future at the Hotel Dieu was at stake, if this was done, we cannot perhaps blame him for his attitude towards the senior Pelletan if all is taken into account. How Dupuytren became chief of the Hotel Dieu was told to Malgaigne by Lisfranc, who was a former pupil, and later a rival of Dupuytren. The climax of the trouble between Pelletan and his junior was reached when a Russian officer was brought into the Hotel Dieu, for a deep wound of the thigh, received eight days before. Pelletan examined the case, thought there was a deep abscess, which had come to the surface above Poupart's, and made a quick, deep incision into the mass, when a fountain of blood gushed up, inundating the operator and his assistants. The femoral was cut across! Pelletan hesitated; Lisfranc, who was assisting, states that Dupuytren had told him how to deal with such a hemorrhage, and applying his fingers with much pressure over the common iliac, the hemorrhage stopped. Pelletan, thinking it was the iliac itself he had wounded, and not being familiar with the ligature of large vessels (in common with many other surgeons of his time), made two parallel incisions above Poupart's ligament, passing a Deschamps' needle deeply between, then ligating the tissues between, encompassing the abdominal wall as well as the deeper structures in the ligature, which he then tied tightly. He then asked Lisfranc to suspend the compression, which he reluctantly did. A frightful hemorrhage showed that the vessel had not been included in the ligature; in desperation Pelletan crowded charpie after charpie into the wound, but all to no avail, and some hours later the unfortunate officer was no more. The occurrence naturally caused much talk, a commission of Russian surgeons made inquiry about the unfortunate ending of the case, and shortly afterwards Pelletan lost his position at the Hotel Dieu.

Dupuytren, arriving one morning after this event, said to his interns with joy on his face, "Congratulate me, this place, for which I have worked for twenty years, is mine, and it is beyond the power of any one to take it from me. I am surgeon-in-chief of the Hotel Dieu!" He

was appointed to this position on September 9, 1814, and two years before this he had been appointed professor of operative medicine.

It is of interest to note, particularly at this time, that in connection with his work at the Hotel Dieu, Dupuytren established a dressing station in the centre of the French lines during the revolution of 1830, and remained there all day under fire, with his interns, attending to the wounded. From 1802, the time of his first appointment at the Hotel Dieu, until 1835, he hardly missed a day, a period of over thirty years. Lenoire says, "We have seen him sick, febrile, ietere, accomplishing the rigorous duties which he had set himself, omitting nothing."

What manner of man was this king of surgeons and surgeon to the King? Probably no great man was ever more hated and envied, and at the same time more looked up to for his consummate skill. Gaillard tells us that he was of commanding figure; one could easily recognize the "grand maître," a noble head and a forehead worthy of Jupiter Olympus. His words were usually brief; he had a tone of voice which had a finality about it which admitted of no discussion and no reply. His dress was of the simplest, and ordinarily he was negligent in this regard,—an old green coat, socks over the tops of his boots, he walked the wards of the hospital every inch a king, and woe be it to the person who thought they could presume, on account of his eccentric dress! He did not indulge in any luxuries, his whole mind and body being given to his work. It is said that he disliked compliments excessively, and the "flatteries which lay unctuous to the soul of the little great."

Pariset tells us that he criticised or blamed no one, which is probably untrue, as we know from studies of his early days at the Hotel Dieu. He certainly had reason in the "penible" beginnings to blame and criticise many. His expression was not, we are told, like the coldness of marble, but was somewhat preoccupied, giving the idea of one rapt in meditation. He would visit the hospital at six or thereabout each morning, and if all the house staff were not at attention, or any were missing from their proper place, there was trouble. He examined all the patients with great care, and laid great stress on a careful history, and repeated physical examinations. After the visit he would sit down on his big green sofa, which his assistants and students loved as part of himself, and talk over the cases. There was a special house-officer, whose business it was to make a *careful and minute record of all the unusual and interesting cases, the records of their operations, and to do nothing else.*

After the operations were over, and the cases in the wards had been visited, Dupuytren made it a rule to be present at any autopsy of a case in his wards, and he was the first surgeon to follow out this rule in France. "About eleven A.M., he took the little roll of bread given to the surgeons from time immemorial at the Hotel

Dieu, and without thinking anything about his old green coat with the holes at the elbows, walked along the pavements, munching his meagre crust." At this time, as Gaillard quotes, "*Nul astre à ses cotés lève un front rival.*" Always at about seven in the evening he would make a second visit at the hospital to see the operated cases of the morning, and any others demanding attention. Dupuytren's private practice was slowly acquired, but at the zenith of his powers reached immense proportions. It is estimated that at this time he saw ten thousand patients yearly, outside his hospital work. With all this immense amount of labor, Dupuytren did not write as much as some of the other great French surgeons of his time, but what he did write was of the best. Much of this is contained in the "*Leçons Orales*," which were gathered in book form, and published by his pupils, Pierre de Boismont and Marks. Among the most interesting of these lectures to us today are perhaps the ones on bone cysts, abscess of the right iliac fossa, including appendicitis, and congenital dislocation of the hip. In the essay on bone cysts we find much that sounds as if it were written today, so clear is the knowledge of the condition, bone cyst occurring in the long bones, etc. Warning is given that bone cysts are liable to become malignant, and complete extirpation is advised. Dupuytren made an extensive study of gunshot wounds, and also began a work on stone in the bladder, which was finished by Sanson and Beguin. Perhaps the only work he is universally remembered by to this day, is his memoir on contracture of the palmar fascia, and its operative cure. He made a study of tuberculosis, and anthrax, and made an exhaustive study of burns, making a new classification. He was the first surgeon to amputate the cervix of the uterus for cancer, and the first to devise a rational procedure for excision of the lower jaw. His operation for the establishment of an artificial anus was one of his greatest triumphs. His work on fractures, and especially fractures of the fibula and the lower end of the radius, is classic.

No sketch of Dupuytren would be complete without a brief account of his relation to the Court of France, and the part he played in the sad event of the assassination of the Duke de Berry.

In 1816, he was created a baron, and the Order of St. Michael was conferred upon him, and in 1820, he was made consulting surgeon to Louis XVIII, and on his death, in 1821, he was appointed surgeon to Charles X. At this time Dupuytren had acquired great wealth, and being cognizant of the condition of the Royal exchequer, sent the following note to the King.

"Sire: Grace in part to your benefactions, I possess three millions; I offer you one, I in-

tend the second for my daughter, and the third I reserve for my old age."

This generous offer was not, however, accepted by the King, perhaps on account of court etiquette, or perhaps a sudden change for the better in the royal finances.

On the 13th of February, 1820, the King's nephew, the Duke de Berry, was mortally wounded by the hand of an assassin. The following account of the tragedy is drawn from Dupuytren's own report to the Academy of Medicine, and Cabane's graphic description, which was based on this report.

The Duke was on his way back to the opera, after conducting the Duchess, who was a few months pregnant at this time, to her carriage. He had just turned to go back to the theatre, when the assassin, Louvel, plunged a poniard into his chest. The Duke cried out, "*Je suis assassiné, Caroline, un prêtre!*" Unfortunately, the Duke pulled the poniard from his chest, and the wound started to bleed fast. The patient was carried to the ante-chamber of his opera box, and here Dupuytren saw him. Bleeding, then almost universally done, had been accomplished from the arm. There was a question that the poniard was poisoned, and Dr. Bougon heroically applied his lips to the wound; luckily for him, this proved not to be the case. After consultation, Dupuytren decided to enlarge the wound and see if he could not stop the hemorrhage, which was exsanguinating the Duke. This exploration showed a penetrating wound of the chest, and all the surgeons present felt that further intervention was not to be thought of, and that nothing more could be done. The King, who had been anxiously awaiting the result of the consultation, addressed Dupuytren thus, "*Superestne spes aliqua salutis?*" and when Dupuytren replied in the negative, the King raised his eyes to heaven, saying, "*Que la volonté de Dieu s'accomplisse.*" The autopsy showed that the poniard had passed through the right lung, the pericardium, and had entered the right auricle. There were two litres of blood in the right side of the chest.

Notwithstanding the King's gratitude to Dupuytren for his services in this sad case, his treatment was severely criticised by his confrères, and most of them argued that non-interference would have been a better policy. Nothing could, however, have changed the result.

It is of interest that Dupuytren was made the hero of one of Balzac's novels, under the name of Desplein; the novel was the "*Messe de l'Athèée,*" and Desplein (Dupuytren) is described thus: "Desplein, one of the greatest of French surgeons, appeared like a meteor in the world of science. . . . Like all geniuses, he was without an heir. . . . The glory of surgeons resembles that of actors, which exists only in their life, and their talent is not appreciated when they are gone."

Sainte-Beuve, Malgaigne tells us, often spoke with pride of the fact that he had had the honor of being at the Hotel Dieu as one of Dupuytren's externs.

The following incident well illustrates the great surgeon's insight into human character. When patients came into the clinic suffering with dislocations, it was the practice of some surgeons to have the patient made somewhat intoxicated, so that there could be more muscular relaxation obtained, and the dislocation reduced more easily, and without danger. Dupuytren used other ways, as will be seen. A woman came into the clinic with a dislocation of the shoulder. Said Dupuytren, "Your hurt comes from the fall you have had, but you didn't tell me you were drunk when you fell; your son told me." The woman fell in a sort of swoon at this, and Dupuytren reduced the dislocation in an instant. When the woman recovered consciousness, Dupuytren said to her, "Your shoulder is in place, and I know perfectly that you only drink water."

In 1822 Dupuytren operated on a young girl for the removal of a tumor of the neck. When the tumor was nearly ready for complete removal from the surrounding tissues, there was suddenly a hissing sound and the patient suddenly expired. Dupuytren, without moving, looked long and searchingly at the operation wound, and then explained to the onlookers what had happened, that entrance of air into a large cervical vein had killed the patient. This was the first time this phenomenon had been demonstrated. It is said he gave on the spot, sadly and gravely, as beffited the occasion, one of his most illuminating lessons.

Cruveilhier tells us that when things were going wrong at operations, and in great emergencies, where life hung in the balance, that "Dupuytren was more than a man, he was the god of surgery."

One of Dupuytren's sayings was, "I have been mistaken, but I have been mistaken less than other surgeons."

It is not to be wondered at that his almost superhuman efforts, long continued without rest, should at last have their effects, and one day while walking to the Hotel Dieu in November, 1833, Dupuytren was seized with an attack of apoplexy; it was a slight attack, and he continued on his way to the hospital, but the students noticed that his speech was thick, and soon after this, in 1834, he was obliged to take a respite from his labors. He journeyed to Italy and his passage to that country was one continual ovation. Before going, he said to a colleague, "*La repose, c'est la mort!*" He was afflicted with a pleurisy and was tapped, taking the greatest interest in the diagnosis and treatment of his own case. Almost in his dying moments he recognized a dislocation of the elbow, which other good surgeons had failed to recognize. The day of his death he had the paper read to

him, wishing, as he said, "To take above the news of this world." He died on the 8th of February, 1835, at the age of 57, and it is said that over 1000 workmen assembled at his grave, to pay their last respects to the Surgeon of the Hotel Dieu. Two hundred thousand francs were left to medicine by Dupuytren, and this sum was used under the direction of Orfila, for the creation of a pathologic museum, which is known as the Musée Dupuytren in Paris.

Pilastre has the following words concerning this great man, which fittingly end an account of his life.

"Posterity has forgotten the faults and errors that the contemporaries of Dupuytren rigorously reproached him with, . . . and has confirmed the homage which science, far away from the passion of the times, has rendered to the greatest surgeon of the nineteenth century,—a man who had lifted himself from the most humble to the highest rank, and added another name to the glories of France."

### Medical Progress.

#### PROGRESS IN GYNECOLOGY.

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##### TRANSPLANTATION OF THE OVARY.

As a result of Tuffier's<sup>1</sup> wide experience in transplanting ovaries, he has formulated "a new theory of menstruation." It is, briefly, that each month there is produced by internal secretion in the body of the human female, a chemical substance of unknown origin. When a sufficient quantity has accumulated, it acts on the ovary, which in turn reacts, modifying the secretion. It is this modified secretion which produces menstruation and is eliminated with the menstrual discharge. If menstruation does not appear, the retained substance produces "autointoxication," known clinically as the change of life. Part of this theory, namely, that menstruation is a cleansing process, has a familiar sound.

One fact on which this theory is based is that Tuffier brought on menstruation by injecting blood serum from a patient who was just about to menstruate. Furthermore, menopausal symptoms disappeared following such injection. Tuffier holds, therefore, that menstruation should be preserved whenever possible in women under forty. He estimates that about one-third of the endometrium should be left instead of performing a complete hysterectomy. As ovarian tissue also is necessary, this need may be supplied by autoplastic operation, successful in a large enough percentage of cases to make it

a justifiable procedure. The ovary or ovarian tissue is buried without suture in the subperitoneal fat of the abdominal wall.

That the success of such grafting is not enough for the relief of menopausal symptoms was shown by several cases in which regular monthly congestive periods were observed, presumably corresponding to ovulation, but without menstruation. Only when menstruation occurs are the menopausal symptoms relieved. It was this observation that led Tuffier to the conclusion that the suppression of menstruation was the real cause of the symptoms.

One of the practical problems suggested is the treatment of young women from whom it is necessary to remove both ovaries on account of disease which precludes reimplantation. Grafts from other individuals have always been failures in the hands of Tuffier though he is still hopeful that improved technic, namely, increased knowledge of the conditions under which tissue grows, may ultimately give success here.

The literature on transplantation of the ovary is reviewed to date by Martin<sup>2</sup> whose conclusions may be quoted as follows. The surgical value of the procedure is questionable and the results are disappointing. Autotransplantation of ovarian tissue as practised at present seems to retard and modify the symptoms of the artificial menopause in a certain number of cases. Probably the effect depends on the ability of the graft to maintain its vitality in its new environment. A simple technic seems to give as successful results in autotransplantation as does a complicated technic with an attempt definitely to couple up the blood vessels. The occasional success of homo- and hetero-transplants suggests that the antagonism of tissue, which is nearly constant, may be overcome, though just how is not known, and more successful results be obtained.

Storer<sup>3</sup> presents a discussion of the question of ovarian transplantation, based chiefly on a study of the literature, and reports a case in which the operation was apparently followed by a pregnancy. The patient had had the left ovary and both tubes removed three years before on account of gonorrhreal infection. She was desirous of matrimony conditioned on the possibility of pregnancy, and demanded operation though success seemed improbable.

At operation there were many dense adhesions and the ovary was found to contain many small cysts. The tubal stumps were half an inch long. The right tubal stump was divided downward until the uterine cavity was laid open. The ovary was bisected from above downward so that each half retained at least some of its original blood supply. The cut surface of the distal half was closed with catgut and left in place. The proximal segment was introduced into the incision in the uterus and sutured so that most of the cortex projected into

the uterine cavity. The uterine wall was then closed over it and its pedicle.

Nine months later, on account of some increased pain in the pelvis and a mass on the right side of the uterus, the patient was operated upon again and the piece of ovary which had been left *in situ* was removed with a cyst the size of a child's fist. Some time later the patient had the signs of early pregnancy, but at the middle of the fourth month there was a uterine hemorrhage, with the expulsion of a mass of detritus, presumably a miscarriage, though not confirmed by microscopic examination. The uterus, however, rapidly decreased in size and the other signs of pregnancy disappeared.

#### FATE OF THE OVARIES AFTER HYSTERECTOMY.

Vineberg<sup>4</sup> discusses the fate of the ovaries after hysterectomy. The matter cannot be settled by experimental studies for comparatively few cases of hysterectomy come to secondary operation, and experiments on animals are no more than suggestive as the anatomical conditions are not strictly analogous. Searching the literature with some care, Vineberg finds numerous articles and comments on the subject, but no marked agreement of opinion. In fact, in some cases the ovaries have undergone little or no apparent change even a year after hysterectomy; in others there is evidence of congestion; in a third group there is atrophy, and in some there is "cystic degeneration" and a tendency to the formation of adhesions.

It has been suggested that interference with the blood supply, occurring practically always in the human, is the cause of anatomical changes in the ovary. At the present time all that can be said is that the ovaries may or may not be affected but probably will be because of interference with the blood supply.

In considering the effect on the function of the ovary, we are again unable to arrive at a satisfactory conclusion because we do not know enough of the cause and nature of the climacteric. In certain cases, following operation, there are no symptoms of the climacteric. In certain cases without operation the symptoms of the climacteric are marked. While it may be true that the symptoms of the climacteric, following operation, are due to trauma of the pelvic sympathetic nerves at operation, this explanation does not hold for patients who have not been subjected to operation. It seems better to regard the cause of the climacteric symptoms as something as yet unknown, than to attribute them to something which does not explain all cases.

The value of Vineberg's paper lies chiefly in the support it gives to the other side if anyone makes categorical or sweeping statements as to the effects of leaving or removing the ovaries at hysterectomy.

#### CORPUS LUTEUM CYSTS AND MENSTRUATION.

It may be said that in general menstruation is not affected by cyst formation in the ovary. Halban<sup>5</sup> has noticed for some years that in certain cases of cyst development, menstruation ceases suddenly. Such a case might easily be mistaken for extrauterine pregnancy. This coincidence of ovarian cyst and amenorrhea is not accidental, but has a causal relation, for such cysts are corpus luteum cysts.

It seems probable that the corpus luteum exercises a restraining influence on the appearance of the menstrual flow. Halban and Koehler<sup>6</sup> found that the extirpation of the corpus luteum in the human female is followed by the appearance of the menstrual flow. If the extirpated corpus is implanted in the abdominal cavity, menstruation does not appear. It is true that the premenstrual changes in the endometrium are due to the corpus luteum, but bleeding does not appear until the influence of the corpus luteum is removed or is diminished.

The explanation of the cases to which Halban has called attention is that with the formation of corpus luteum cysts there is a persistence of the effect of the lutein tissue far beyond the normal period of time; as the cysts atrophy, and sometimes they spontaneously disappear, menstruation reappears and if an actively secreting cyst be removed, menstruation recurs.

This point may be of some diagnostic value and will influence treatment, for corpus luteum cysts rarely need operation because they have a tendency to regress. "Alternating cysts," that is, cyst development in both ovaries at different times with spontaneous disappearance, are to be regarded as corpus luteum cysts. They are thin walled and thus easily ruptured during examination. It has been found also that their extirpation during pregnancy does not cause interruption of the pregnancy.

#### NERVES OF THE OVARY.

As the result of his extensive studies which he describes in detail, Wallart<sup>7</sup> comes to the conclusion that the relations of the nerve supply in the germinal gland are by no means as simple as has been hitherto generally supposed. In spite of the care of his own studies, he says that final judgment is not yet to be passed in the matter. The great wealth of the ovary in nervous elements, and its manifold tissue formation of internal secretion capacity, as follicle, corpus luteum, interstitial gland, and perhaps also the deciduallike formations during pregnancy, cause the ovary to appear as one of the most complicated and interesting organs, and therefore, inviting detailed and comprehensive investigation. The humoral relations of the ovary to the rest of the organism, to which so much attention has of late been directed on account of the emphasis placed on internal secretions, are not the only bonds which exist, and the neural correlation may be of even greater importance.

ance, although at present it is not understood at all.

#### OVARY AND ABDERHALDEN REACTION.

Solowjew<sup>7</sup> has found that in every case in which the presence of pregnancy could be determined with certainty, the Abderhalden serum test was positive, but that in cases in which pregnancy was not present the test was sometimes positive and sometimes negative. In ten cases in which the serum was from men the test was negative, but in one case, a woman certainly not pregnant, the test was positive. This suggested to him the possibility of the reaction depending in some degree on the ovarian function, and in two girls who had never menstruated he found the test was negative. This recalls the report of Kjaergaard who found strong proteolytic action in the serum of women during the premenstruum.

#### SALPINGITIS.

Waetjen<sup>8</sup> presents a careful and thorough study of the histology of suppurative salpingitis and its relation to the question of etiology. Since Schridde's publication in 1910 on purulent inflammations of the tubes, there has been very active interest and some polemical discussion. His thesis that gonorrhreal salpingitis presented a characteristic histological picture has been rejected outright by certain pathologists and gynecologists, and has received support in varying degree from others.

The forms of salpingitis investigated are: (1) following dilatation with laminaria tents. In this group were forty-eight cases, in seventy-five per cent. of which there was found salpingitis. The pregnancy had been interrupted on account of advanced tuberculosis of the lungs, in nearly every case, and the tubes had been removed to produce absolute sterility. Clinically, the introduction of the tent was entirely benign in this series, as in series reported by others, but sixteen cases showed slight inflammation (endosalpingitis only), fourteen moderate grade of inflammation involving the muscular wall of the tube also, and six severe inflammation though no ulceration was observed. In no case could the inflammation be traced to the gonococcus or to early tuberculosis. The histological picture also suggested that a complete *restitutio ad integrum* was likely to follow. In non-pregnant women the tents produced no salpingitis.

(2) Tuberculous salpingitis. Here there is little cause, histologically, for confusion, because of the typical changes produced by the tubercle bacillus, but two points should be noted. Even in purulent salpingitis with tuberculosis the tuberculosis may be secondary, on the basis of an old inflammatory process, as Simmonds has pointed out; and there may be found a "catarrhal" salpingitis with no characteristic changes,

histologically, but with tubercle bacilli present. One of Waetjen's cases was of this very early form. In two cases in which there was a characteristic change in the wall of the tube and pus in the lumen, no caseation was present and no plasma cells were found in the pus.

(3) Salpingitis ex appendicitide. There is a frank difference of opinion between clinicians and pathologists as to the frequency of the spread of inflammation from the appendix to the tube. The clinician claims it is a frequent occurrence; the pathologist holds it to be rare. That such acute inflammation may involve the tube from the appendix is exemplified by one case in Waetjen's series. Perisalpingitis secondary to appendicitis is not infrequent. That secondary endosalpingitis may be of serious grade so as to cause a destructive process or pyosalpinx, there is grave reason for doubting. But the case of a girl of sixteen with the history of attacks of appendicitis years before, and with traces of an old destructive process in the tube also, suggests that the endosalpingitis following appendicitis may be serious in nature. Practically always the inflammation following appendicitis shows involvement from the serosa inward and not from the endosalpinx outward. Waetjen is inclined to agree with Pankow who says: "In all inflammations and adhesions of the adnexae and pelvic peritoneum, in which septic or gonorrhreal infection from the uterus, or tuberculosis, can be excluded, we shall find by the microscopical examination of the grossly normal appendix the cause of the otherwise inexplicable pelvic changes."

(4) Gonorrhreal salpingitis. The histology of gonorrhreal salpingitis has been most thoroughly studied and accurately described by Schridde and Amersbach, as even the opponents of their views acknowledge, but that the changes they describe are characteristic of gonorrhreal salpingitis is denied. In these cases there is formation of pus even very early, though the earliest cases cannot be distinguished from the cases of laminaria salpingitis except by the presence of the gonococcus and the abundance of lymphocytes. In the pus there are abundant plasma cells and epithelium. Only later is the loss of epithelium and the formation of ulcers found. There is fibrin in the pus but no sign of necrosis.

The plasma cells, on which Schridde has laid so much emphasis, are found in the wall of the tube, in the projections of mucous membrane especially, and also in the pus. This picture is found frequently, and perhaps in every case of gonococcal infection of the tube, but it is found also in a few cases in which the clinical evidence is against gonorrhea and no gonococci are found. Waetjen noted five such cases so that he cannot agree with Schridde that the gonococcus is the exclusive cause of ulcerative processes in the tube with marked plasma cell infiltration.

The conclusions are as follows.

a. The laminaria salpingitis is characterized by its hemorrhagic tendency, its leucocytic pus and the absence of lymphocytes and plasma cells. The process is not always limited to the endosalpinx and may resemble phlegmonous inflammation of the wall of the tube.

b. Tuberculous salpingitis can easily be distinguished by the histological changes except in the very early catarrhal form in which the diagnosis rests only on the presence of the tubercle bacilli.

c. The salpingitis following appendicitis (endosalpingitis very rare) presents in itself nothing characteristic. Generally it is a perisalpingitis easily made out under the microscope.

d. In the acute stage of gonorrhreal salpingitis there is a striking accumulation of plasma cells and of lymphocytes in the tissue and in the pus, by which early gonorrhreal processes can be distinguished from septic processes. In the subacute and in the chronic stages the histological picture is nearly always characteristic for the gonorrhreal and for the septic forms, but occasionally septic organisms produce adhesions of the endosalpinx and plasma cell infiltration. The character of the pus is distinctive, lymphocytic and with plasma cells in gonococcus infection, and leucocytic in septic cases. Yet a diagnosis is not always to be made by mere examination of the pus, for secondary infections are possible and do occur. In general, therefore, Waetjen supports Schridde's views.

#### CONSERVATION OF THE TUBES.

Loehnberg<sup>9</sup> reports a series of cases in which plastic operations on the uterine tubes were performed. The procedure was introduced into operative gynecology in 1885 by A. Martin, who designated it salpingo-stomato-plasty, meaning the opening by plastic operation of the abdominal tubal ostium which had been closed by inflammatory process, so as to give a permanent opening with permanent restoration of function. Skutsch advocated the term salpingostomy, which has persisted in general use.

The number of cases reported from various clinics has fallen off considerably in recent years, and little attention is paid to the operation in textbooks. The results have not been satisfactory as regards facilitating impregnation, for which various causes have been assigned. The tube may have been closed at the uterine end also, or the opening did not remain patent, through the formation of other adhesions. The disease, in the first place, having come from a gonorrhreal infection, may have rendered the husband incapable of begetting children.

The danger of extrauterine pregnancy in the repaired tube has been emphasized, but as a matter of fact it is very slight, according to Loehnberg. The only case reported was in a patient operated on for extrauterine pregnan-

cy; a plastic operation was performed on the closed tube of the other side, with a second extrauterine pregnancy about a year later. The actual number of cases of pregnancy is very small. The results, however, as far as secondary operations are concerned, are favorable, the mutilated tube rarely demanding another operation.

The series reported by Loehnberg consisted of twenty-one cases, over a period of five years, and subjected to later examination as far as possible. The indications for operation are chronic inflammation without much obvious disease of the tubes, as marked distention from hydrosalpinx. Perisalpingitis with little disease of the tube would be favorable. Acutely inflamed tubes should not be operated upon, and if pyosalpinx is present on one side, no plastic operation on the other side should be attempted. The convalescence in the cases reported was about as in cases of salpingectomy. In two cases the abdomen was opened later, three and five years after operation, for conditions not connected with the pelvis and the tubes were found to be closed again. Only fourteen cases could be traced.

The subjective symptoms were much improved as a result of the operations, which had in fact been other than simple salpingostomies. Examination showed all but two cases to be normal: these had small masses in the position of the tubes. No pregnancy had ensued, either intra- or extrauterine.

The cause of the failure of these operations, Loehnberg attributes to the technic of operation, the difficulty of obtaining an opening of the tube which is permanent and adequate to receive the ovum. The methods employed were splitting the tube, excising a piece to form a fenestra, cutting off the closed end of the tube, in all cases suturing the mucous membrane and peritonium together and fixing the end of the tube to the ovary.

In spite of these bad results, Loehnberg thinks the operation is indicated as a cure for sterility, (1) if the wife alone is at fault, and the history and findings suggest closure of tubes by inflammation; (2) as a conservative operation in disease of the tubes, of a chronic character, without much injury to the tube itself, and always in young persons.

#### CAUSE OF TUBAL PREGNANCY.

Mall<sup>10</sup> presents a preliminary report as to the cause of tubal pregnancy, based on the study of one hundred and seventeen specimens. The detailed account of the specimens was planned for publication Number 221 of the Carnegie Institution of Washington.

Two aspects of tubal pregnancy are discussed, the cause of the extrauterine nidation and the fate of the enclosed ovum. Mall's presentation is so compact that it does not lend itself to condensation, but certain conclusions as to the cause of tubal pregnancy may be noted. "A review

of specimens, which is accompanied by data bearing on the cause of tubal pregnancy, shows quite definitely that the condition is associated with inflammatory changes which must have preceded the lodgement of the ovum in the uterine tube." This inflammation affecting the tubal epithelium, or any other change which delays the ovum in its progress, will favor tubal pregnancy. Among these conditions are abnormal diverticula. To what extent inflammation outside of the tube interferes with the progress of the ovum in the tube is not clear. But it is found that "if the ovum within the tube contains a normal embryo, there is but little adjacent inflammation; if it contains a pathological embryo the changes in the tube are usually marked, and when the ovum is well disintegrated, the changes are still more pronounced. Read in the other way, this would mean that if the inflammatory condition is nearly healed, the ovum implants itself in the tube and grows normally, but if the results of infection are still pronounced, the ovum rapidly disintegrates. Such an inflammatory process is signalized not only by an inflammatory reaction in the tube wall, but also by very pronounced changes within the tube lumen, the most common of which is a condition known as follicular salpingitis."

"Another type of change differs markedly from follicular salpingitis, but in a way seems to go hand in hand with it. This condition may be spoken of as an outpocketing of the epithelial lining" into the muscular coat. According to the situation and extent of the pathological changes implantation occurs in the outer, middle or inner portion of the tube.

On the character of the etiology of the inflammation, the study of the specimens throws no light. But the history of the cases points strongly toward venereal disease as the chief cause of tubal pregnancy, though an infection at a previous labor is apparently the cause occasionally. For the extremely interesting discussion of the fate of the enclosed ovum, reference must be made to the original article.

#### VULVOVAGINITIS AND GONORRHEA IN CHILDREN.

Wolfenstein<sup>11</sup> reports briefly the results of treatment of gonococcal vulvovaginitis in children. A point which he investigated with great care is the frequency with which there occurs at the same time gonococcal infection of the rectum. In his series the percentage was fifty-four; the highest figure hitherto reported was thirty-eight. For this discrepancy, Wolfenstein is inclined to think that repeated examinations, during the whole course of the treatment of the vulvovaginitis, are responsible. In about one-half of the cases the diseases coincided at the beginning of the treatment; in the other half positive results were found on examination from eight days to eight weeks after the beginning of treatment. Generally the course of the rectal infection is without symptoms. In the

chronic cases there may be palpable and permanent lesions, as stricture, but the chief danger is that of reinfection of the vulva and vagina. The results of treatment tested by bacteriological examination indicate that in this situation the disease is at least as resistant as in the vulva and vagina. Of the cases under treatment, nearly all were finally discharged cured without permanent injury. On account of the danger of infecting the vulva and vagina, the rectal condition should be given treatment with silver salts.

Taussig<sup>12</sup> contributes a careful study of the prevention and treatment of vulvovaginitis in children. Reports from various cities indicate that this disease is not at all infrequent and bacteriological examination shows that nearly always vulvovaginitis in children is gonococcal. A series of two hundred and sixty-two patients coming to a dispensary for various conditions was examined with reference to the presence of a discharge. If a discharge was found, examination was made for the gonococcus and it was detected in fourteen cases. In very few cases did the patient come on account of the discharge.

A study of the sixty-six sporadic cases in Taussig's series of gonococcal infections indicates that the source of the infection was rarely the parent, rarely from possible rape, rarely from infected clothing or from the bath, and rarely from other children by direct contact. The lavatory seat in the school seems to be the chief source of infection. Forty-seven of the sixty-six were of the school age.

The symptoms do not often cause much discomfort and the mother first notices the discharge. Occasionally ophthalmia or arthritis is the first manifestation of the disease. In the acute stage the patient may complain of burning on micturition or increased frequency.

In the way of treatment, Taussig recommends for the first two weeks rest in bed as much as possible, with vaginal instillations of twenty-five per cent. argyrol twice a day. For the third and fourth weeks, daily instillations of one per cent. silver nitrate; for the fifth and sixth weeks, two per cent. silver nitrate once in two days and from the seventh to the tenth weeks, four per cent. silver nitrate twice a week. In keeping up the systematic treatment the visiting nurse association has given valuable aid. The prognosis is generally favorable in time, but it is difficult to say just how soon a case will be cured or when it is actually cured. Ultimate danger to the child is probably not great, though occasionally a serious complication follows.

Prevention is the most important. Taussig's suggestions are as follows:

- (1) Instillation of two per cent. solution of silver nitrate into the vestibule of all new born girls whose mothers show evidence of gonorrhea. Probably but a small number of infections come

in this way, but no harm is done by this treatment.

(2) Making vaginitis in children a reportable disease, as the disease nearly always comes from outside the family and the patient is innocent.

(3) Instruction of parents of infected children—through the visiting nurse—regarding preventive measures to limit infection.

(4) Investigation by the visiting nurse as to the probable origin of the infection with a view to preventing contamination of other children.

(5) Adoption of the U-shaped seat with the low bowl and other precautionary measures to prevent spread of infection through public lavatories in schools, play grounds, comfort stations and tenements.

"Gonorrhea in adults is so intimately connected with the public morals that any marked diminution in its presence seems like trying to reform the universe. Gonorrhea in little girls, on the other hand, is simply the result of inadequate sanitary precautions . . . a disgrace to the hygienic methods in the beginning of the twentieth century."

#### VAGINITIS.

Hoehne<sup>13</sup> attributes to the activity of the *Trichomonas vaginalis* a characteristic form of vaginitis. The parasite has already been recognized as an inhabitant of the vagina, and in association sometimes with inflammation, but generally it has been considered as of no pathogenic significance. Hoehne reports a series of twelve cases which he selects from a series of over a hundred, in which he found abundant masses of the infusoria, varying forms of bacteria, but no gonococci. The discharge was rather thin, abundant, yellowish and foamy, irritating and causing marked inflammatory reaction, occasionally ulcers. Subjectively the symptoms vary but were chiefly burning and itching, sometimes so severe as to interfere with patient's occupation.

In a series of one hundred and four non-pregnant women, the parasites were found twenty-nine times, and in a series of one hundred and two pregnant women, thirty-five times. That is, in nearly one-third of the cases examined the trichomonas was present, never with the gonococcus, though often with other bacteria. He describes at length the technic employed in fixing and staining the parasites, but defers until a later paper a discussion of the therapeutic measures which he has found so successful.

#### VAGINAL BACTERIA AND MENSTRUATION.

Hellmuth<sup>14</sup> has conducted a series of investigations to determine, if possible, whether menstruation has any influence on the hemolytic properties of the bacteria in the vagina.

It is very unusual to find hemolytic streptococci in the vagina during pregnancy, but they are not infrequent in the lochia even in patients who have no elevation of temperature. The significance of the hemolytic property is not at all understood. By some it is regarded as a definite characteristic property, especially in the virulent strains of streptococcus. By others it is thought that hemolysis has nothing to do with virulence, but is simply due to the blood content of the nutrient medium and is, therefore, a purely accidental peculiarity which the different bacteria causing puerperal fever assume under certain as yet unknown conditions. If the presence of blood in the medium is then a determining factor, hemolysis would be expected in continued bleeding as in prolonged menstruation or in menorrhagia.

Hellmuth investigated carefully in both in-and-out-patient departments of the clinic, under very rigid precautions, to prevent contaminations. In three cases out of thirteen, there were found hemolytic bacteria, one in- and two outpatients. The in-patient had a purulent abdominal incision and hemolytic bacteria were found on the external genitalia as well as in the vagina. The two out-patients could not be controlled, of course, and the germs may have been introduced at coitus. But in twenty-two examinations during and in the first three days following menstruation, there was no trace of hemolytic bacteria. This indicates that it is not the blood content of the medium which is the cause of the hemolytic property of bacteria.

#### DYSTOCIA FOLLOWING PERINEORRHAPHY.

Pouliot<sup>15</sup> reports a case of dystocia due to suture of the levatores ani. The patient had had a forceps delivery and six months later underwent an operation for repair of the torn perineum. During the ensuing pregnancy the attending physician was struck by the thickness and firmness of the perineal body which at the time of labor proved too resistant for the normal expulsive forces, and "episiotomy" had to be performed. This result of perineoplasty, not very rare if suture of the levators is undertaken, should be carefully guarded against in young women who are likely to have children. "To wish to do better than Nature may be dangerous," and if the levators are approximated, their line of contact should be as nature provides.

#### COMPLETE TEAR OF THE PERINEUM.

Pozzi<sup>16</sup> describes in minute detail an operation for complete laceration of the perineum which he has practised for some years, and has already described in outline. For certain cases it is the operation of choice, and consists of freeing the rectum and pulling it down. An H-shaped incision is made between bowel and vagina and carried high enough and far enough, laterally, to permit descent of the rectum, with

very little traction, to the perineum or to the newly constructed anus. A flap is thus turned down over the anus and the structures laterally including the levators are approximated in the median line. The operation is not new, but the excellence of Pozzi's description and the clearness of the illustrations deserve attention.

#### LEUCORRHEA.

Zweifel<sup>17</sup> describes at some length the treatment of leucorrhea. After reviewing a few of the older procedures, he calls particular attention to some of the more recent methods of treatment, mentioning the dry method, the use of yeast preparations, sugar and lactic acid. Bolus alba (kaolin) is introduced as a powder and gives immediate beneficial results, but soon after treatment ceases, there is a recurrence. Of the yeast preparations, Zweifel gives no description, as he has had no personal experience with them.

Following the suggestion of Kuhn, Zweifel has employed sugar in fifty per cent. solution, introduced on a tampon and left for twenty-four hours. The patient then uses a douche at night on going to bed. The patient is instructed to put two teaspoonsfuls of sugar in the irrigator, and two teaspoonsfuls of very hot water on the sugar. The solution is then cooled and introduced into the vagina, after which the patient goes to bed. The treatment is continued at home for eight or ten days after which the patient returns for consultation.

Of sixty-six cases so treated, two-thirds came back and these showed very satisfactory results. A few, however, were resistant, and formalin was applied to the cervical canal. In the cases still resistant, lactic acid in solution of one-half of one per cent. was employed. If this strength gives burning or irritation, it may be diluted. This general line of treatment gave satisfactory results, and as the patients were kept under observation for some time, the beneficial permanent effects were determined.

#### URINARY INCONTINENCE.

Newman<sup>18</sup> describes an operation for urinary incontinence due to incompetence of the sphincter of the bladder which he has devised, and has been using for a number of years. It resembles somewhat an operation described by Kelly, but differs from that in its main object. Newman uses a knobbed bougie in the bladder drawn against the internal meatus to determine the position of the neck of the bladder. He then makes a lozenge shaped denudation of the vaginal mucous membrane, an inch and a half or two inches in length with its widest part, about three-fourths of an inch, over the bulb of the bougie. The tissue is then approximated from side to side, with interrupted or Lembert mattress sutures, which push in the tissues lying in the median line. Over this the vaginal tissue is closed to give further support. New-

man says the object of the operation is to bunch up the mucous membrane inside the internal meatus, thus blocking the passage of the urine and giving control. Undoubtedly there is some shortening of the sphincter of the bladder also.

#### BLADDER FUNCTION AFTER CONFINEMENT.

The question of why catheterization is necessary in the puerperium and especially after operation, has not been answered satisfactorily for all cases. But certain factors seem clear, and Taussig<sup>19</sup> analyzes the histories of one hundred and fifty-seven puerperal, and four hundred and five post-operative (non-puerperal) cases. Among the interesting points which he brings out in his discussion are first, the influence of the form of anesthesia, comparing fifty-eight cases operated on under spinal anesthesia and fifty-eight cases operated on under ether, all voiding spontaneously. In the former group, ten and one-half hours was the average time for the first voiding, in the second group, twelve hours. It was noted also that some cases voided spontaneously, but were not able to empty the bladder, so that catheterization became necessary after several days.

Taussig favors the retention catheter for post-operative paralysis, (cancer of the cervix), but relies on the ordinary form of rubber catheter kept in place by adhesive plaster. Certain objections to the mushroom retention catheter are thus obviated.

In regard to infection, Taussig holds that the danger of infection lies less in the technic or frequency of catheterization, than in the presence of stagnating urine in the bladder. Therefore, prophylactic treatment should be continued until the bladder fully empties itself. As a harmless, but, under certain conditions, effective stimulant to the bladder Taussig has used air injected by means of an air tight syringe. In the few cases in which it has been used, it was successful ten out of eleven times. Other methods of stimulating the bladder have been recommended, of which pituitrin is sometimes efficacious and boroglyceride seems to do more harm than good, according to Taussig.

#### COLON INFECTION IN THE KIDNEY.

Furniss<sup>20</sup> discusses colon bacillus infections of the kidney and attempts to formulate answers to the following questions: (1) Why are the urinary organs so susceptible to the colon bacillus? (2) What are the factors predisposing to infection? (3) What is the exciting cause? (4) How does it gain entrance? (5) What is the natural course of the infection? (6) What offers the best means of eradicating the infection?

The answer to the first question is not easy. Furniss says "at no time have the urinary organs been the natural habitat of the colon bacillus." The predisposing factors are interference with function, from obstruction to the flow

of urine, due to a multitude of individual causes; then causes which lower the vitality of the body in general and of the bladder in particular, as depressing illness, toxemias, exposure to cold. Probably the greater mobility of the right kidney explains the increased frequency of infection found there.

The exciting causes are bacteria, coming from infectious foci anywhere in the body, especially if in or near the intestinal tract. It seems as though the bacteria from these foci originate the urinary disease and the colon bacillus is a secondary invader. Perhaps the answer to the first question is that they are not susceptible except when infected by some other organism first.

The weight of opinion at present is that these urinary infections are chiefly hematogenous in origin; some are due to lymphatic extension and a few are examples of ascending infection.

The natural course of these infections is short and acute, from five to twelve days. They tend to recovery unless there is persistence of some predisposing or exciting cause. This should be kept in mind and such cause or causes looked for and removed. Especially is this true in cases of relapse or chronic infection. If the course is chronic there is a tendency to suppuration of the kidney, or gradual destruction of the renal function.

The most satisfactory treatment in the acute stage is keeping the patient in bed, administering large quantities of water with urotropin and the application of heat to the lumbar region. When the acute symptoms have subsided, Furriss finds autogenous vaccines of benefit. Pyelitis, if persistent is treated with weak solutions of silver nitrate, but in every case a most careful search must be made for the cause of the trouble. This and the amount of damage already done to the kidney determine the treatment and whether operation is or is not indicated.

#### CALCIUM IN PELVIC DISEASE.

Of late years so much attention has been devoted to the operative treatment of various forms of disease, that too often the non-operative treatment has been neglected, and it is the non-operative treatment of inflammation in the pelvis that Landsberg<sup>21</sup> recommends. In this condition it is no longer considered good surgery to subject every case to operation, and there is considerable evidence as to the value of non-operative treatment, certainly in the acute stage.

Calcium has been found to be of value in combating inflammatory processes, and for about a year Landsberg has used calcium lactate in the treatment of acute pelvic inflammatory disease. The number of cases (eighteen) is too small to form a basis for far reaching conclusions. But under the administration of calcium the progress seemed more rapid than under other methods of treatment, which were

tried first. Calcium is now used in connection with other means of relief and employed in the form of a one per cent. solution, which is injected hypodermically. Not more than three cubic centimeters should be introduced at any one point, as it may cause marked skin reaction. The total maximum dose should never exceed ten cubic centimeters. The injections are repeated every two or three days, as near as possible to the inflamed area. For vaginitis a five per cent. solution is recommended.

Another condition of which the treatment is discussed by Landsberg is the bleeding of puberty as well as of the climacteric, without obvious cause. There may be supposed some "dysfunction" of the ovary or of the uterus to account for it. Landsberg has employed extract of corpus luteum, prepared for hypodermic injection. The seven cases treated were cured, using one cubic centimeter of the preparation every two days, and observation for months afterward showed that the effect was not transitory.

#### GYNECOLOGICAL AFFECTIONS AND TUBERCULOUS DISEASE.

Butner<sup>22</sup> calls attention to the importance of making a thorough general examination in patients who complain of pelvic symptoms, but in whom there is little or no anatomical basis for such symptoms. In these obscure cases, of which he cites several examples, he has found, usually after he had been treating the patient for some time for pelvic disease, that the pelvic symptoms were due to tuberculosis of the lungs. It is this particularly which should be kept in mind in any obscure pelvic condition characterized by physiological rather than by anatomical abnormalities.

#### GYNECOLOGICAL DISEASE IN THE INSANE.

Gibson<sup>23</sup> reports a series of one hundred operations for gynecological disease in the insane. The question of the advisability of operations for the relief of gynecological conditions has received considerable attention of late, with some polemical discussion as a result of Bossi's contributions to the literature, but not many writers have attacked the subject systematically. The reports of series of cases have in general been of little value, for no effort has been made to classify the psychoses found. This is probably due to the fact that the operator is not familiar with psychiatry and depends on his associates to select and tabulate his cases.

Gibson has arbitrarily divided the various forms of insanity into two groups: (1) forms in which there appear various degrees of deterioration or dementia; and (2) forms in which dementia does not appear. For the first group of cases there is little hope from operation, except that it may improve the physical condition, and make it easier to care for the patient. In the second group of cases the re-

sults of operation may be beneficial, for if definite lesions were corrected it may be thought that some effect on the psychosis can be determined. To prove this will take long series of cases, and the patient observation over long periods of time. Immediate results are not conclusive.

The immediate results in a series of one hundred cases are reported by Gibson, however, the mental condition of the patients being determined by the staff of the Kings Park State Hospital. Of these, fifty-five belonged to the first group in which no benefit was to be expected and none was actually found. Seventeen of the second group were considered by the staff to be benefited by the operation. Of twenty-six of the manic depressive group, thirteen were improved, or fifty per cent. But, of course, a long period of observation is necessary to determine permanent results. The operative mortality was one per cent., death resulting from a pontine hemorrhage the day after operation.

The earlier investigators gave a large percentage of improvement, some even as high as sixty-eight, while later writers give from sixteen to eighteen per cent. The author agrees with Taussig's conclusions that every woman with manic depressive insanity should have a pelvic examination, and if a definite lesion is found, it should be corrected by local treatment or operative measures.

#### NERVOUS PHENOMENA FOLLOWING OÖPHORECTOMY.

Gordon<sup>24</sup> has seen so many ill-advised operations on the female genitalia, that he presents a summary of some of his experiences. If the ovaries are removed the effects are far reaching and multifactorial, as can be seen by the changes which take place in the other glands of internal secretion. The equilibrium of the system is upset and there arise distinct disturbances, chiefly functional. It is the nervous and mental disturbances which Gordon considers especially in his paper.

The series covers one hundred and twelve cases, in thirty-seven of which oophorectomies were performed through errors in diagnosis. In thirty-four women who complained of various manifestations of neurasthenia, psychasthenia or hysteria, there was complaint, among other symptoms, of vague disturbance in the abdomen. Oophorectomy was advised and was carried out. The organs were found to be normal, but the immediate effect of the operation was beneficial in some, yet without effect in others. Later the symptoms became worse in all.

In the remaining seventy-five cases, there was some disease of the pelvic organs; radical operations having been advised and accepted were performed. While operation removed some local symptoms, others more severe with mental and nervous disturbances developed in the months following operation. Some of the patients, though not actually insane, required care in an institution.

Gordon urges that, since the removal of the reproductive organs produces such profound mental and nervous symptoms, they be not removed for slight cause or for no cause at all, as in some of the cases he saw. A more thorough study of the patients who complain of nervous symptoms or of pains of a vague character should be made by a neurologist before the operation is decided upon.

#### COAGULEN IN PELVIC SURGERY.

Albrecht,<sup>25</sup> encouraged by the favorable results of the use of coagulen reported by Fonio, Koehler and others, has employed it in gynecological conditions. Coagulen is a substance which hastens the coagulation of the blood; it was prepared by Fonio from animal blood platelets, and has been placed on the market by a Swiss firm. Its effect is described by Fonio as hastening and increasing the coagulation of the blood. This is very marked in the test tube, but if given subcutaneously or intravenously, it produces quickly a transitory shortening of the coagulation time of the circulating blood.

The trade form is a powder, but a ten per cent. solution should always be freshly prepared for administration. The cloudy solution may be boiled for two or three minutes without impairment of its action. The bleeding surface is sponged off and immediately a pack wet with the solution is applied.

Albrecht's experience may be summarized briefly. Coagulen works promptly in parenchymatous oozing from raw surfaces. In arterial bleeding and in any considerable venous bleeding, it is of no value, for the blood pressure quickly displaces any clots which may form. The field in gynecology and abdominal surgery is thus chiefly intraperitoneal, in oozing from raw surfaces in the pelvis or on the intestine. If the pack is removed with care, no bleeding occurs, and no post-operative bleeding has been reported.

A substance which checks bleeding so satisfactorily has been used, of course, for many hemorrhagic conditions, for example, in the essential menorrhagia in young girls, where it was given hypodermically (quite painful). But after twelve hours there is no appreciable effect on the blood. Intravenous injection has been followed by collapse in several instances and may be regarded as too dangerous. In reclana neonatorum as in hemophilia, its use has been followed by the desired result. But in abdominal and pelvic surgery, it is a certain and rapid local styptic in parenchymatous bleeding from raw surfaces.

#### FACULTATIVE STERILITY.

Stoeckel<sup>26</sup> has practised a new method of operating to produce "facultative sterility." His patient who had had five children in five years, with a psychosis in the fourth pregnancy which appeared again in a more serious form in the

fifth, was very anxious that the possibility of conception should not be removed, though she realized the danger to herself. The operation which Stoeckel performed was to make incisions as for the Alexander-Adams' suspension of the uterus, opening the peritoneal cavity, however. The tube was then drawn up and buried for its outer one-half beneath the peritoneum. By using fine catgut in the serosa only of the tube and employing great care, there was almost no trauma to the tube. The result so far has been entirely satisfactory. Whether the tubes will later be opened and whether then conception will occur, cannot be told, but the operation would seem to offer a possible method of inducing temporary sterility.

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## Book Reviews.

*The Kinetic Drive, Its Phenomena and Control.*

By GEORGE W. CRILE, M.D., Professor of Surgery, Western Reserve University. Philadelphia and London: W. B. Saunders Co. 1916.

This small volume presents the text of the Wesley M. Carpenter Lecture delivered by the author before the New York Academy of Medicine in 1915. It is a preliminary epitome of a projected monograph which will offer complete experimental evidence upon which the themes and postulates of this essay are founded.

By kinetic drive Dr. Crile indicates the state of increased energy transformation characteristic of modern human civilized life. This increased activation is secured by the kinetic mechanism of the adrenals and the thyroid. As kinetic diseases the author describes Graves' disease, cardio-vascular disease, Bright's disease and diabetes. He differentiates between acute and chronic emotional activation by means of the kinetic drive and outlines the means of its medical and surgical control. The operative

treatment of these kinetic diseases he describes briefly as dekineticization. The work is illustrated with a series of twenty-one excellent figures, many of which are full-page plates. It is an admirable and interesting preliminary statement of a new development of the author's now familiar theory of nociceptor stimulation. The publication of the completed work will be awaited with attention.

*Diseases of Occupation and Vocational Hygiene.*

Edited by GEORGE M. KOVER, M.D., LL.D., Washington, D. C., and WILLIAM C. HANSON, M.D., Belmont, Mass. Philadelphia: P. Blakiston's Son & Company. 1916.

This volume, edited by two well known internists and sanitarians, presents the contributions of 29 selected experts on various aspects of industrial diseases and the hygiene of vocation. The work is prefaced by a historical review, by the editor, of the development of industrial hygiene and of its progress in the United States. The text of the book is divided into three parts, of which the first deals with specific and systemic diseases of occupation, with fatigue and the neuroses; the second with the causation and prevention of the diseases and accidents of occupation; and the third with the methods of investigation employed in the study and control of industrial conditions from the hygienist's standpoint. The book is illustrated with 46 cuts and a number of reference pages. Particular attention is directed to the chapters on diseases and hygiene of the ear, skin and nervous system and on those relating to carcinoma and the diseases of animals important in industrial connection. The volume should establish its value as a standard textbook on these subjects of new and growing popular and professional concern.

*Diagnostic Methods.* By HERBERT THOMAS BROOKS, A.B., M.D., Professor of Pathology, University of Tennessee. Third edition. St. Louis: C. V. Mosby Co. 1916.

This third edition of Brooks' laboratory manual of clinical chemistry, appearing in so short a time after the publication of its predecessors, is evidence that the book has proved its value among many similar works. It is intended as a guide for history taking, the making of routine physical examinations and the usual laboratory tests necessary for students in clinical pathology, for hospital interns and for practising physicians. It is written particularly for those who have only a limited amount of time to give to laboratory work. This edition has been carefully revised, reviewed and rewritten, obsolete tests have been omitted and new ones added, and there is a new chapter on the technique of staining and examining smears and exudates. The book is illustrated with 31 text cuts.

*The Physiology of the New-Born Infant. Character and Amount of the Katabolism.* By FRANCIS G. BENEDICT, M.D., AND FRITZ B. TALBOR, M.D., Carnegie Institution of Washington. Publication No. 233.

This contribution from the Nutrition Laboratory is a report of one phase of the study of new-born infants by Drs. Benedict and Talbot, that has been going on for several years, and of which other phases have been reported in other places. This report shows that the view so generally prevalent of a large storage of carbohydrate in the human embryo, is probably not altogether in accord with the facts, although it appears that the metabolism is more nearly of the carbohydrate type the sooner after birth the determinations are made. These authorities show clearly that it is only a matter of a few hours before whatever reserve of carbohydrate may have been present is exhausted, and the infant is thrown upon its tissues (chiefly fat) for its energy supply. In the light of this fact they discuss the question of proper dietary treatment of the new-born. They show that colostrum, although admirable in substance, is not sufficient in amount to serve the full requirements of the young infant. They suggest, moreover, that since the early metabolism is not carbohydrate, as has been supposed, there is a possible danger of acidosis if the metabolism is over-accentuated. The importance of preventing undue muscular exertion on the part of the new-born infant, as in excessive crying, is shown, and the possibilities of artificial nourishment at this period discussed. The report is well worth the careful attention of pediatricians and others who are interested in the problems of infant nutrition.

*A Manual of Gynecology and Pelvic Surgery for Students and Practitioners.* By ROLAND E. SKEEL, A.M., M.S., M.D., Associate Clinical Professor of Gynecology, Medical School of Western Reserve University; Visiting Surgeon and Gynecologist to St. Luke's Hospital, Cleveland; Fellow of American Association of Obstetricians and Gynecologists; Fellow of American College of Surgeons. With 289 illustrations. Philadelphia: P. Blakiston's Son & Co. 1916.

"This manual is intended to furnish a concise, practical working knowledge of gynecology with especial emphasis upon diagnosis and treatment." The intention of the author has been carried out well along established lines. The text is much better than the illustrations, which need more completely descriptive legends to enable them to fulfill their purpose. The lists of references to the literature are a feature which

other American textbooks of gynecology would be wise to adopt. They are not intended to be complete, but they serve to indicate quickly where further treatment of a subject may be found. There are a few typographical errors which might be misleading, as the legend below Figure 266. In general the book is quite up-to-date and its estimates of recent innovations are just. In its field, the book should prove a distinctly useful addition to the works on gynecology.

*Progressive Medicine.* Vol. xix, No. 2, June 1, 1916. Edited by HOBART AMORY HARE, M.D., assisted by LEIGHTON F. APPLEMAN, M.D. Philadelphia and New York: Lea & Febiger.

This number of *Progressive Medicine* presents the usual digest of progress in medical and surgical sciences during the preceding quarter. Under the subject of "Hernia," particular attention is devoted to the relation of this condition to the Workmen's Compensation Law. Surgery of the abdomen and gynecology are separately considered. Under the latter, Percy's heat method in the treatment of inoperable uterine carcinoma is discussed in detail and illustrated by several figures. Under "diseases of the blood" are considered diathetic and metabolic diseases, diseases of the thyroid gland, spleen, nutrition and lymphatic system. There is a brief terminal section on ophthalmology. The volume is a valuable contribution by a score of well-known American experts to the literary record of recent progress in the medical and surgical sciences.

*The Practitioner's Medical Dictionary.* By GEORGE M. GOULD, A.M., M.D. Third edition revised and enlarged, by R. J. E. SCOTT, M.A., B.C.L., M.D. Philadelphia: P. Blakiston's Son & Co. 1916.

The two previous editions of Gould's Medical Dictionary have been reviewed in former issues of the JOURNAL with approval. This third edition, based on recent medical literature and containing all the words and phrases generally used in medicine and allied sciences, with their pronunciation, derivation and definition, is issued to bring the publication up to date by the inclusion of new and current words and terms, and of words from the sciences allied to medicine. About 20,000 such new terms have been added making a total of over 70,000 words in the dictionary. The work is illustrated with many tables and a few cuts. The author and the editor are to be commended for retaining the Greek letters in their etymologic descriptions. The book should continue to fill its useful and established position as a reliable and complete medical dictionary.

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### PROSPECTIVE MEDICAL MEETINGS.

The seventh annual meeting of the American Association for Study and Prevention of Infant Mortality will be held at Milwaukee, Wis., on October 19, 20 and 21, 1916, under the presidency of Dr. S. Max Hamill of Philadelphia. The subjects to be discussed at this meeting include federal, state and municipal governmental activities in relation to infant welfare; the care available for mothers and babies in rural communities; standards for infant welfare nursing; and morbidity and mortality in infants from measles and pertussis. The session on measles and pertussis will be held in conjunction with the Milwaukee County Medical Society. The work of the meeting will be divided between the sections on obstetrics, propaganda, pediatrics, vital and social statistics, public school education for the prevention of infant mortality, and rural communities and nursing and social work.

The annual business meeting will be held on October 20, at which will be presented the reports of affiliated societies through which the association is in touch with activities for the prevention of infant mortality in seventy-six cities representing twenty-eight states, the District of Columbia, Canada and the Philippine Islands. The Association was organized in November, 1909, following a conference held at Yale University by the American Academy of Medicine. Its objects are to study the causes of infant mortality, to awaken interest in the possibility of its reduction, to formulate plans for its prevention, and to act as a clearing-house for the collection and dissemination of information on these subjects. The headquarters of the Association were established at Baltimore in 1910. Its work is carried on by correspondence from the central office, by investigations and studies made by standing and special committees, by its annual meeting, and the publication of its transactions and by a traveling exhibit. It has over 150 affiliated organizations and 950 individual members.

Members of this Association who attend the meeting in Milwaukee, are invited also to attend the forty-fourth annual meeting of the American Public Health Association, under the presidency of Dr. John F. Anderson of New Brunswick, N. J., which will be held at Cincinnati, from October 24 to 27. The program of this meeting has been adopted as the official program of the annual municipal health officers' conference of Ohio. At the general sessions of this meeting there will be symposia on mental hygiene and public health nursing. There will also be meetings of the sections of public health administration, laboratory, vital statistics, sanitary engineering, sociology, and industrial hygiene. This Association was established in 1872, and its membership includes the health officers of the leading cities in the United States and Canada, the executive officers of many state and provincial departments of health, the leading officials of the United States and Canadian Government health services, and many bacteriologists, chemists, sanitary engineers and sociologists.

The seventh annual session of the Clinical Congress of Surgeons of North America will be held at Philadelphia during the week of October 23, 1916. An elaborate clinical program has been arranged at the various hospitals of the city in accordance with the custom of the Congress. There will also be a series of evening ses-

sions, at which papers will be presented. The presidential meeting will be held on Monday evening, October 23, at which Dr. Fred Bates Lund, of Boston, will be inaugurated and will deliver the presidential address on "The Indications of Cholecystectomy." There will be other papers on gall-bladder surgery, by Dr. J. M. T. Finney of Baltimore and Dr. Charles H. Mayo, of Rochester, Minn. The evening session of Tuesday, October 24, will be devoted to renal and vesical surgery, and that of October 25 to gynecology and obstetrics. On these days, also, there will be a special symposium on ophthalmic, rhinological and laryngological surgery. On Thursday evening, October 26, there will be papers by Dr. C. A. Porter of Boston on "Surgery of the Peripheral Nerves," and by other surgeons of distinction on various aspects of the cancer problem. On Friday evening, October 27, a public meeting will be held under the combined auspices of the Philadelphia County Medical Society, the department of public health and charities, and the Clinical Congress of Surgeons of North America. At this meeting Dr. Weston A. Price of Cleveland will speak on care of the teeth, Dr. Joseph C. Bloodgood of Baltimore on diagnosis of cancer, and Dr. Robert W. Lovett of Boston on curable deformities and the importance of their proper treatment.

It is expected that the limit of attendance for this Philadelphia meeting will be reached some weeks in advance of its opening, so that those surgeons who wish to attend but have not yet registered are urged to apply to the secretary-general, Dr. Franklin H. Martin of Chicago. The Clinical Congress of Surgeons of North America has become an established factor in the surgical life of this country, and this annual meeting for 1916 promises to prove as attractive and valuable as its predecessors have been. It is a matter of local congratulation that this Congress is to be held under the presidency of a Boston surgeon, to whom the JOURNAL takes pleasure in extending its good wishes for his tenure of this honorable and distinguished position.

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#### A PSYCHIATRIC CLINIC FOR PRISONERS.

THE establishment of a psychiatric clinic by the Rockefeller Foundation in Sing Sing prison marks a long step forward in dealing with this

class of offenders against society. Every one is familiar with the work done by Warden Osborne and his Mutual Welfare Society, but now we are approaching the problem from another, more scientific, side. Whether the results will be as encouraging or not remains to be seen. Certainly the work would seem to be directed against the very nucleus of the problem,—the mental make-up of the criminal, which led him to crime, the possibility of a readjustment of his attitude towards life, and the therapeutic indications for cure.

The actual work of the clinic began August first, under the direction of Dr. Bernard Glueck, formerly of the Government Hospital for the Insane, where he had been for six years in charge of the Howard Hall Department, where are sent all federal prisoners who become insane. Glueck has already contributed largely to the literature of insanity among criminals, and is the author of a work, "Studies in Forensic Psychiatry," which is now in the press. He is one of the American exponents of Alfred Adler, and it will be interesting to observe whether or not his studies of neuroses among prisoners will bear out Adler's views of organ-inferiority rather than Freud's sexual etiology or Jung's libido concept.

It is high time, indeed, that some effort was made in this country to investigate the mental status of the habitual criminal, especially the vagabond type of Kraepelin. It will surprise no one who has had any acquaintance with psychiatry to find that a large percentage of these individuals are defective in some way,—high-grade imbeciles, psychopathic characters, constitutional inferiors, or abortive precoces.

The most important part of the work of the new clinic, however, will be the determination of the future of such cases. Many solutions have, of course, been offered in the past. Sterilization, reeducation and permanent segregation are the three chief. Without taking the space here to discuss the matter more fully, it is probable that the most satisfactory disposal of the State's habitual criminal would be the establishment of a colony where they could be definitely separated from society as a whole for an indeterminate time, possibly for their lifetime. However, we shall see what the new clinic has to offer along this line. Certainly we may expect from Dr. Glueck a comprehensive study of the subject and illuminating contributions to its literature.

## THE POSSIBILITY OF NOVOCAINE ADDICTION.

WHETHER or not the Harrison law will ultimately prove effectual in abolishing, or at least minimizing, the evils of addiction to drugs, is dubious as yet. The intent of the law is good, but recent judicial decisions and interpretations have warned us that there are vulnerable places in it. Leaving out of the discussion for the moment opium and its derivatives, we have to consider cocaine, which would present an easier problem. In the first place there is not in the case of cocaine an addiction in the special sense we mean when we speak of morphine addiction. The devotees of the former drug get in the habit of taking the drug at intervals, these being regulated, in the lower class of users, by fluctuations of their personal finances, and in the higher class by circumstances of expediency. Following a cocaine debauch there is a true depression, but not the physiological craving for the drug which the opium habitué experiences. In the second place, cocaine has a more limited field in medicine than opium does, and it is not impossible that it may be replaced as a local anesthetic by other drugs, which do not possess among their properties the production of emotional exaltation.

Among the drugs which naturally occur to us in this connection is novocaine. This powerful anesthetic, like others of its class, ends in "caine," to indicate its physiological action as a local anesthetic, but is not chemically related to cocaine, being the hydrochloride of the organic base para-amino-benzoyl-diethylamino-ethane, a derivative of para-amino-benzoic acid, while cocaine is benzoyl methyl-eegomine. It does not appear, from what scant information is available, that novocaine produces the psychic effects which cocaine does; however, a great deal more data must be obtained before any conclusions can be drawn as to this. If true it would seem that the substitution of novocaine for cocaine, wherever at all possible, would be indicated, so that the latter drug could be withdrawn from the market entirely. Before this is done the proper procedure would be to test out novocaine on a group of individuals of varying temperaments, to see whether or not it ever produces emotional reactions of a pleasurable nature.

## PROGRESS OF POLIOMYELITIS EPIDEMICS.

DURING the past week the epidemics of poliomyelitis in the United States have continued, on the whole, with steady abatement. In New York City on September 30 the number of cases reached a total of 9029 with 2286 deaths. In New York State, outside New York City, on the same date, the total number of cases amounted to 2592 with 580 deaths.

In New Jersey the total number of cases on September 19 amounted to 3376, and in Illinois on September 16, 563.

In Massachusetts on September 30, the number of cases during that month reached a total of 608 as compared with 390 during the first eight months of the year. The largest number of cases has been 282 in Boston and the next largest in Holyoke, where, on September 30, there had been a total of 69 cases. On September 28 the number of cases in Pittsfield, Mass., reached a total of 42.

On September 26, Mr. Roger Pierce announced the formation of a Harvard Infantile Paralysis Commission to conduct research into the transmission and treatment of the disease, and to constitute a clearing house for the collection and free distribution of therapeutic blood serum. Mr. Pierce's statement is as follows:

"A Commission consisting of Dr. Robert W. Lovett (Chairman), Professor of Orthopedic Surgery; Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene; Dr. Francis W. Peabody, Assistant Professor of Medicine, and Roger Pierce (Secretary), has been appointed by the Harvard Medical School for the purpose of assisting in the early recognition, treatment and study of infantile paralysis."

The Commission has undertaken this work in the endeavor to meet the increasing demands from physicians for assistance in making an early diagnosis, and for serum to be used in the treatment of the earliest stages of the disease. It is not at present definitely established that the use of serum is of benefit in the treatment of the disease. In the opinion of competent authorities, however, the results thus far obtained justify its distribution to physicians for use in cases where they deem it advisable.

The serum is obtained from the blood of persons who have recovered from the disease. The Commission, therefore, suggests that such persons may render a service to children now afflicted by allowing a small amount of their blood to be taken. The proceeding is without danger. All persons who are willing to aid in this way may call at any time at the Harvard Medical

School (Administration Building), Huntington Avenue, and make inquiry for the Harvard Infantile Paralysis Commission. If this is not convenient, an expert will visit the home for the purpose of collecting the blood serum.

Physicians, by telephoning to the Harvard Medical School (Brookline 2380) and inquiring for the Infantile Paralysis Commission, may obtain an expert at any hour of the day or night, who will visit a patient with the doctor to assist in the diagnosis of the case, and to administer serum if desired. The amount of serum available will depend upon the response of recovered patients to this appeal for volunteers. As the response cannot now be accurately estimated, the efforts of the Commission will, at the beginning, be confined to cases in or near Boston. Should it be found possible to extend the service, every attempt will be made to do so.

There will be close coöperation with the State Department of Health and local health authorities.

The serum and all services rendered by the Commission will be free of charge."

Within the first forty-eight hours there were ten responses to this call for serum volunteers. The Boston theatres have now been closed to children, but the public schools were duly opened on October 2.

Attention has been directed to a study of epidemic poliomyelitis as it has occurred in recent years in Sweden. The first extensive outbreak of the disease in that country occurred in 1905, when there were about 1500 cases. About the same number of cases were scattered through the succeeding quinquennium. In 1911, occurred the most serious visitation of the disease in Sweden, where, during the next three years there were 10,000 cases out of a population of 6,000,000. This epidemic had a mortality of 19.79%, and of the survivors, 7000 were permanently disabled. Since 1913 poliomyelitis has remained endemic in Sweden. Wernstedt of Malmo, one of the leading Swedish authorities on poliomyelitis, working with Kling and Peterson, found that the secretions of the mucous membrane of the mouth contained virulent organisms of poliomyelitis 204 days after the onset of the disease. They, therefore, advise continued isolation of patients for a number of weeks after the disappearance of the acute symptoms. In the Swedish epidemics, maximum incidence of poliomyelitis has been at the age of two years.

## MEDICAL NOTES.

**IMPERIAL CANCER RESEARCH FUND.**—The fourteenth annual report of the Imperial Cancer Research Fund, under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England, has recently been issued, recording progress of the year ended July, 1916. The work of the laboratory, already restricted by the war, has, during the past year, lost the services of Dr. Tsurumi, who concluded his investigations on heterologous tumor immunity and left the laboratory at the end of October, 1915. The general conclusion which emerged from his investigations was that the hemolytic and hemagglutination reactions of the sera obtained by immunizing rabbits against mouse and rat tumors were those characteristic of the proteins of the mouse and rat. The complement fixation and precipitin reactions did not run parallel to the species serum reactions, but seemed rather to correspond to the histological characters of the growths used as antigens, showing a considerable independence of their origin.

**PREVALENCE OF MALARIA, PELLAGRA, SMALLPOX AND TYPHOID FEVER.**—The weekly report of the United States Public Health Service for September 15, 1916, states that during the month of July there were reported in Arkansas 810 cases of malaria, 75 of pellagra, 29 of smallpox, and 125 of typhoid fever. During the same period there were 133 cases of typhoid in West Virginia and 30 of smallpox in Colorado.

**CHOLERA IN JAPAN AND INDIA.**—The weekly bulletin of the United States Public Health Service for September 15, 1915, contains report of 1295 cases of Asiatic cholera in the Province of Anan, India, and of 353 cases at Osaka, Japan. There were 467 cases of bubonic plague at Rangoon, with 440 deaths.

**CHANGES IN COST OF DRUGS.**—Report from New York on September 20 describes various recent changes in the cost of drugs, chiefly in the direction of a reduced price for quinine and an increase in the cost of glycerin.

"Quinine has been reduced 10 cents an ounce by domestic manufacturers, who now quote 65 cents an ounce for bulk lots of the sulphate and 98 cents for the alkaloid. An irregular downward revision of all minor salts of quinine is also announced, cinchonine alkaloid being reduced to 25 cents and sulphate to 12 cents, while cinchonidine alkaloid was lowered to 95 cents, and this reduction came as a complete surprise to the drug trade, as manufacturers had long been holding the umbrella at 75 cents an ounce against an outside market price which has varied all the way from 60 to 75 cents an ounce. It is understood that the reduction in quinine was more or less in the nature of a speculative

move and that present prices will soon go by the board, as domestic interests are reported to have purchased the entire output of the great Java quinine factory. At any rate, the consensus seems to be that materially higher prices will be named at a later date, as large foreign orders are about to be placed here. France is known to be in need of large quantities of the drug.

"A boom such as has not been seen here since the early days of the war has been noted in glycerine, and prices are advancing daily. Explosive manufacturers have been in the market for upwards of 100 tons of the dynamite grade, and it is understood that foreign demand also has been formidable factor. Japan is credited with being in the market for large quantities. This has caused a marked upturn in prices, dynamite grade having advanced from 35 cents to 45 cents per pound, while the chemically pure grades have risen from 36½ to 37½ cents per pound to 42½ to 43 cents per pound as to quantity."

#### EUROPEAN WAR NOTES.

**TURKISH RED CRESCENT AND SYRIAN RELIEF.**—Report from Washington, D. C., on September 21, states that the Turkish Red Crescent has yielded to diplomatic negotiations for an extension of American Red Cross work in Ottoman territory, beyond the present limit of operations in Syria.

"The State Department today notified Red Cross headquarters that the Turkish government had agreed to remove its restrictions, and preparations were taken up at once for beginning a great relief campaign in coöperation with the Red Crescent Society of Turkey.

"President Wilson by proclamation has set aside October 21 and 22 for Armenian and Syrian relief days, and it is expected that the funds in hand will be largely increased by contributions received then.

"Already in the sections where the Red Cross is operating, such coöperation has proved successful. About \$200,000 have been sent on to the branches of the society at Constantinople, presided over by the American ambassador, and the other at Beirut."

**EPIDEMIC DISEASES IN AUSTRIA.**—The weekly bulletin of the United States Public Health Service for September 15, 1916, contains report of 397 cases of Asiatic cholera with 147 deaths in Bosnia-Herzegovina; 464 cases of smallpox in Galicia, Austria. There were 1311 cases of typhus fever in Galicia and 909 in Moscow during the months of May and June, 1916.

**UNITED STATES BALKAN AMBULANCE CORPS.**—Report from Paris, on September 22, states that the field service of the American Ambulance has announced the formation of an am-

bulance section to serve with the French army in the Balkans. "The section will include 30 ambulances of the latest model, as well as repair cars, a kitchen car, tents and other accessories for service far from the hospital base. The personnel is now being recruited from veterans of the service.

As American volunteers have served on the Yser, Aisne and Somme, in the Champagne, at Verdun, in Lorraine, and in the conquered parts of Alsace, establishment of a Salonica section extends the service to include almost all of the great campaigns of the French army."

**WAR RELIEF FUNDS.**—On Sept. 30 the totals of the principal New England relief funds for the European War reached the following amounts:

Secours National Fund .....	\$214,626.17
Red Cross Fund .....	165,948.75
Belgian Fund .....	154,389.36
French Wounded Fund .....	122,603.43
Serbian Fund .....	103,456.07
Armenian Fund .....	67,191.61
French Orphanage Fund .....	65,755.17
Surgical Dressings Fund .....	47,654.37
Artists' Fund .....	32,209.88
Italian Fund .....	25,538.04

#### MEXICAN NOTES.

**TYPHUS FEVER IN MEXICO.**—Report from Laredo, Texas, on Sept. 22, states that typhus fever is again extensively epidemic throughout Mexico. It is said that the average daily number of deaths from this disease is 50 in San Luis Potosi, 80 in Aguascalientes, and 100 at Zacatecas.

#### BOSTON AND NEW ENGLAND.

**THE WEEK'S DEATH RATE IN BOSTON.**—During the week ending Sept. 30, 1916, the number of cases of principal reportable diseases were: diphtheria, 24; scarlet fever, 4; measles, 4; whooping cough, 12; typhoid fever, 11; tuberculosis, 47.

Included in the above were the following cases of non-residents: diphtheria, 6; tuberculosis, 3.

Total deaths from these diseases were: diphtheria, 2; measles, 1; tuberculosis, 37; typhoid, 1; whooping cough, 1.

Included in the above were the following deaths of non-residents: tuberculosis, 2.

**CAESAREAN TRIPLETS.**—A report in the daily press, on September 21, records the birth of triplets on that day at the Providence Hospital, in Holyoke, Mass., by Caesarean section. The babies, who are all apparently vigorous, are

two girls, weighing six pounds each, and a boy, weighing five pounds, twelve ounces. It is believed that this is the first instance of the delivery of triplets by this method. Official report of the case will be awaited with interest.

**RING SANATORIUM TRAINING SCHOOL.**—The annual graduation exercises of the Ring Sanatorium Training School were held recently at Arlington Heights, Mass. The principal address was delivered by Dr. E. W. Taylor of Boston. Other addresses were made by Dr. C. T. Warner of Marlboro and by Miss E. P. Davis of the State Board of Registration of Nurses. Diplomas were given to a class of thirteen pupil candidates.

**REDWOOD LIBRARY AND ATHENAEUM.**—The Committee appointed by the Directors of the Redwood Library and Athenaeum, of Newport, R. I., regarding the recent donation of books from the medical library of the late Dr. Rufus E. Darrah, would respectfully report:

That the thanks of the Library be gratefully returned to Mrs. Darrah for her gift of books from the medical library of her late husband;

That this contribution is the more to be appreciated, since the great change that medical literature and the practice of both medicine and surgery have undergone during the past half century has rendered the former works in this department chiefly useful as merely historical and as books of reference, while those of Dr. Darrah are alike of the recent time and in accordance with its advanced state of knowledge; and further,

That the Darrah gift is additionally to be valued from having been the companions and daily guides of a citizen of Newport who, besides his professional skill as a surgeon, was preëminent in his public relations to the city as educator and sanitarian, and ever zealous for the best welfare of Newport.

The Committee recommend that its report be formally adopted by the Directors, and that copies thereof be communicated to Mrs. Darrah, and through the lay and medical press to the many friends, in every field of life, of the late Dr. Darrah.

This report was presented at the special meeting of the Directors held on Tuesday, September 19, 1916, and was unanimously adopted.

ALFRED G. LANGLEY, *Secretary.*

## Miscellany.

### ANIMAL TRANSMISSION OF HUMAN DISEASES.

In connection with the article by Dr. Mark Richardson in the issue of the JOURNAL for Sept. 21, suggesting the possibility of the transmission of poliomyelitis by the rat flea, it is of interest to note a paper read by Dr. David John David at the quarter centennial of the University of Chicago on June 6, 1916, and published in the issue of *Science* for September 8. This paper reviews and discusses certain relations of the lower animals to human disease, and conveniently tabulates as follows the diseases of man which are, or may be, transmitted by animals:

- 1. By the dog:
  - Rabies.
  - Foot and mouth disease.
  - Helminthiasis.
  - Flukes.
  - Tapeworms (especially *Tanmia echinococcus*).
  - Infantile splenomegaly (from dogs through fleas).
  - Trypanosomiasis (*T. gambiense*).
  - Mange.
  - Fleas and ticks.
  - Ringworm.
  - Favus.
- 2. By the cow:
  - Tuberculosis.
  - Actinomycosis.
  - Anthrax.
  - Cowpox.
  - Tetanus (through vaccine).
  - Foot and mouth disease.
  - Septic sore throat.
  - Rabies.
  - Pus infections.
  - Tenia *sanginata*.
  - Milk sickness.
  - Paratyphoid fever.
- 3. By the horse:
  - Glanders.
  - Rabies.
  - Tetanus.
  - Sporotrichosis.
  - Anaphylaxis.
  - Serum disease.
  - Odor of horses.
- 4. By swine:
  - Trichiniasis.
  - Tuberculosis.
  - Anthrax.
  - Cestodes (especially *T. solium*).
  - Trematodes.
- 5. By sheep:
  - Anthrax.
  - Tuberculosis.
- 6. By goats:
  - Malta fever.
  - Tuberculosis.
- 7. By the antelope:
  - Sleeping sickness.
- 8. By the cat:
  - Rabies.
  - Cestodes.
  - Trematodes.
  - Favus.
  - Ringworm.

9. By rats:  
Rat bite fever.  
Bubonic plague (through fleas).  
Trichiniasis (through hog to man).
10. By ground squirrels:  
Bubonic plague.
11. By birds:  
Psittacosis (from parrot).
12. By fish:  
Tapeworms.
13. By arthropods, chiefly insects:  
Mosquitoes:  
Yellow fever.  
Malarial fever.  
Dengue fever.  
Filariasis.  
Fleas:  
Bubonic plague.  
Infantile splenomegaly.  
Ticks and mites:  
Rocky Mountain fever.  
Relapsing fever (Africanus).  
Tick fever of Miana.  
Japanese flood fever.  
Lice:  
Typhus fever.  
Relapsing fever (*Spirochaeta obermeieri*).  
Bedbugs.  
Kala azar.
- Flies:  
Sandfly fever.  
Sleeping sickness (tse-tse fly).  
Typhoid fever and other infections carried mechanically.
- Crustaceans (water flea):  
Guinea worm infection (dracunculosis).
- Oysters, clams, etc.:  
Typhoid fever.
- Snails:  
Trematode infections (especially bilharziosis).

The author further summarizes the methods by which infected agents may be transmitted through or by animals, and calls attention to certain points which may be of importance in the control of such diseases. The article is commended to the attention of physicians interested in the relation of animals to disease.

#### UNITED STATES DEATH RATES IN 1915.

On September 19 the director of the Census Bureau of the United States Department of Commerce issued a preliminary statement of the population, deaths and death rates in the registration area of this country in 1915, with comparative rates for earlier years. This statement shows a total death rate in this area of 13.5 per thousand estimated population,—the lowest rate hitherto recorded in the United States. This rate was based on 909,155 deaths returned from 25 states (in one of which, North Carolina, only municipalities of 1000 population and over in 1910 were included), the District of Columbia, and 41 cities in non-registration states, the total population of this area in 1915 being estimated at 67,337,000, or 67.1% of the total estimated population of the United States.

"There is a widespread and increasing interest

throughout the country in respect to vital statistics. The states of North and South Carolina, which recently enacted the "model law" for the registration of births and deaths, were admitted to the death-registration area for 1916, increasing the estimated population of the area to 70.2% of the total for the United States in that year.

The death rate for 1915, 13.5 per 1000 population, is the lowest ever recorded, the most favorable year prior to 1915 having been 1914, for which the rate was 13.6. It is markedly lower than the average rate for the five-year period 1901 to 1905, which was 16.2. The decrease thus amounts to 16.7%, or almost exactly one-sixth, during a little more than a decade. When due allowance is made for the addition of many new states to the registration area between 1905 and 1915, and the comparison is confined to the group of registration states as constituted during the period 1901-05—the present population of which is about one-fourth of the total for the country—there is still shown a very considerable decrease, from 15.9 to 14.3 per 1000 population, or 10.1%. This decrease, on the basis of the present population, would amount to 42,876 deaths. On the assumption that a corresponding reduction has taken place through the entire country, this would indicate a saving of approximately 170,000 lives in 1915 for the United States as a whole.

The annual report for 1915, to be issued later, will state that changes in the age and sex constitution of the population must be considered before the exact nature and extent of the lower general mortality can be understood. It is certain, however, that the great progress made during recent years in the sciences of medicine and sanitation, together with the widespread awakening of the people throughout the United States to the support of public health authorities, has resulted in the saving annually of scores of thousands of lives that would have been lost under the conditions prevailing only a few years ago.

An accompanying table shows the death rates for the past three years separately and for the consecutive quinquennial years, 1901-1905 and 1906-1910.

The areas to which the figures relate are the registration states and the cities which had 100,000 or more inhabitants in 1910. Separate figures are given for the colored population in states in which colored persons constituted 10% or more of the total population in 1910, and in cities having 10,000 or more colored inhabitants in that year.

In the states for which death rates for 1901-1905 are given, the greatest proportional decrease between that period and 1915 is shown for Rhode Island, 16.9%. Next in order are New York, with a decrease of 14.6%; New Jersey, 14.3%; Massachusetts, 12.7%; Vermont, 9.3%; Connecticut, 5.1%; Indiana, 3.8%; New

Hampshire, 3%; and Maine, 1.9%. Michigan alone showed a slight increase, eight tenths of 1%.

Among the cities having 100,000 or more inhabitants in 1910 the tendency is toward a still greater reduction in mortality. The following-named cities show, for 1915, decreases of 20% or more, as compared with the 5-year period 1901-1915: Newark, N. J., 29.9%; Atlanta, 28.4%; New York City, 26.8%; Los Angeles, 25%; Jersey City, 24.9%; Pittsburgh, 23.9%; St. Louis, 22.9%; Denver, 22.7%; Providence, 22.3%; Paterson, 21.9%; San Francisco, 21.7%; Fall River, 21.7%; Louisville, 21.1%; and Nashville, 20%.

It should be borne in mind that the rates here given are "crude" rates, which make no allowance for differences in the sex and age distribution of the population, and that, furthermore, the rates for certain localities are materially affected by deaths of non-residents who are attracted to those localities by their favorable climate or by their superior hospital facilities. Inferences in regard to the relative healthfulness of different states and cities should not, therefore, be drawn without more thorough investigation.

### THE STORY OF THE DACK FAMILY: A STUDY IN DYSGENICS.

In a recently published bulletin (No. 15) of the Eugenics Record Office, Anna Wendt Finlayson, field worker of the Warren (Pa.) State Hospital, records, with a preface by Charles B. Davenport, a "study in hereditary lack of emotional control," based on the history of the Dack family in that State. As a study in dysgenics, this account suggests and deserves careful comparison with the well-known Jukes. The story of the Dack family has recently been summarized in the daily press from this bulletin as follows:—

"In 1815 William and Mary Daek and their young son, Samuel, came from Ireland and settled in Western Pennsylvania. William was a peculiar, silly old fellow who drank a good deal, stole sheep and other valuables. Mary, his wife and also his cousin, was ignorant, quarrelsome, and would become angry at her husband and leave him for days at a time.

"This pair proved a bad investment for the United States and particularly for Pennsylvania. Mrs. Finlayson, investigating for the Warren State Hospital, got track of 754 names of descendants or persons who married descendants. Taking out all persons dying at less than 20 years of age, all persons marrying into the family and all who moved away and were entirely lost track of, Mrs. Finlayson had left 153 descendants of William and Mary concerning

whom she was able to secure fairly complete data.

"Of the lot no one was a distinctly good citizen or a force for good in the community. Forty, although mostly of a low order of intelligence, are capable of controlling their emotions and have not been a burden on society.

"In the second group are 72 individuals. The members of this group show various evidences of degeneracy, such as shiftlessness, illiteracy, lack of average judgment, sexual irregularity, heavy drinking, quick and violent tempers and inability to control their emotions.

"In the third group are 41 individuals. Some of these have been in insane asylums, some in penitentiaries, some in jails, and some in poor-houses. Most of the insane have had some form of emotional insanity. They are quarrelsome, quick tempered, violent and given to sulking. The disposition to leave their marital mates is very marked.

"Twenty-five were insane, 20 are described as lazy and shiftless, 39 are below the average of intelligence and 34 are described as ugly and quarrelsome. Thirty were alcoholics, 27 were notoriously sexually irregular, 18 had a habit of leaving their husbands or wives, as the case was.

"Of the nine children of William and Mary, Jane and Curtis founded the two worst family trees. Jane married her cousin, a bad man. Curtis married a defective woman from defective stock. The traceable cost to the State for caring for worthless descendants of this pair is \$28,354. The actual cost to society has been infinitely greater than that. There is no way of knowing the cost to the State or the value to the State of the members of the family who have moved far away."

### Society Report.

#### FIRST LEGISLATIVE CONVENTION OF MASSACHUSETTS PHYSICIANS.

Worcester, Mass., Sept. 20, 1916.  
The convention was called to order at 11 a.m. by Dr. M. A. Tighe of Lowell, chairman of Middlesex North District Committee. As temporary chairman he reviewed the history of the movement to interest the medical men of the State in an effort to have the Workmen's Compensation Act amended so that it would be fairer to the physicians throughout the State.

He appointed as a Committee on Credentials: Dr. G. Forrest Marten of the Massachusetts Homeopathic Society.

Dr. S. A. Mahoney, of Hampden District.  
Dr. J. A. Mehan, of Middlesex North District.

This committee, during a short recess, examined the credentials of those in attendance. After the recess the committee reported that forty men, representing fifteen of the district societies and the Massachusetts Homeopathic Society, were present. Report was accepted.

It was voted that officers of the convention consist

of chairman, vice-chairman, secretary and treasurer. Election was by ballot, and resulted as follows:

Chairman, Dr. William H. Merrill, of Essex North. Vice-Chairman, Dr. George O. Ward, of Worcester. Secretary, Dr. Joseph A. Mehan, of Middlesex North.

Treasurer, Dr. Ernest L. Hunt, of Worcester.

On motion of Dr. C. J. Burgess of Essex North it was voted that the name of the convention be, "The First Legislative Convention of Massachusetts Physicians."

It was moved by Dr. M. A. Tighe, of Middlesex North, that it is the sense of this convention that the Workmen's Compensation Act is unfair to the physicians of Massachusetts, and should be amended so as to give the injured workman the right to select his physician.

An amendment was offered by Dr. Mehan of Middlesex North, that the words "without sacrificing any of the benefits of the Act" be added.

Another amendment was offered by Dr. W. T. Hopkins of Essex South, that the words "workmen" and "and" be inserted, so that the motion would read in part "unfair to the workmen and physicians."

A further amendment was offered by Dr. J. B. Howland of Suffolk that the words "or hospital" be inserted after the word physician so as to read in part "to select his physician or hospital."

The motion was freely discussed, and on motion tabled.

It was later voted to refer the motion as tabled to a committee of three, nominated from the floor, to arrange a motion in accordance with the original and the amendments offered.

The Committee selected consisted of Drs. M. A. Tighe of Middlesex North, F. J. Cotton of Suffolk, and M. J. Cronin of Norfolk. They retired, and on returning presented the following resolution, which was unanimously adopted:

That it is the sense of this convention that the Workmen's Compensation Act is unfair to the workmen and physicians of Massachusetts, and should be amended so as to give the injured workman the right to select his physician, surgeon, hospital, or all three without sacrificing any of the benefits accruing to him under the Act. Furthermore, the Association should be responsible for the expense of medical and surgical and hospital care during the first two weeks after injury, and if the employee is not immediately incapacitated thereby, from earning full wages, then from the time of such incapacity and in unusual cases—in the discretion of the board for a longer period.

The subject of health insurance was introduced by Dr. T. F. Greene of Norfolk and discussed by Drs. R. M. Merrick, F. J. Cotton and W. W. Walcott. The subject is of great importance to our men, but it was felt that we should not take a definite stand on the matter at this time because the convention had been called for the specific purpose of discussing the Workmen's Compensation Act.

Recess for lunch was taken from 1.30 to 2.15 p.m.

A motion was offered that the convention as organized be a permanent body. Following discussion, the motion was tabled.

It was voted on motion of Dr. I. J. Clark of Essex North that the organization of this convention and all of its actions be reported to the several societies for their endorsement or rejection, and that its permanency be entirely dependent upon their action.

On motion it was voted that when the convention adjourns it be to the call of the chair and officers.

It was voted on motion of Dr. F. B. Pierce of Essex North that a committee of one delegate from each district delegation and one from the Massachusetts Homeopathic Society be appointed and constitute a Central Committee, to be given full power to proceed in carrying out the recommendations of the convention.

It was also voted that each district delegation elect its member to the Central Committee, and a recess was taken for such election.

On motion of Dr. A. W. Marsh of Worcester it was voted that the quota of the Massachusetts Homeopathic Society on the Central Committee be three instead of one.

On motion of Dr. A. H. Quessey of Worcester North it was voted that the secretary of the convention be added to the Central Committee and act as its secretary.

The question of raising funds to carry on the work was discussed, and the method of raising them left to the Central Committee.

The Central Committee as elected is as follows: Barnstable, J. P. Nickerson.  
Berkshire —  
•Bristol North —  
•Bristol South —  
Essex North, W. H. Merrill.  
Essex South, W. T. Hopkins.  
•Franklin —  
Hampden, S. A. Mahoney.  
Middlesex North, M. A. Tighe; J. A. Mehan, Sec.  
Middlesex South, W. W. Walcott.  
•Middlesex East —  
Norfolk, R. M. Merrick.  
Norfolk South, N. S. Hunting.  
•Plymouth —  
Suffolk, R. M. Green.  
Worcester North, A. H. Quessey.  
Worcester, E. L. Hunt.  
Mass. Homeopathic Soc., G. Forrest Marten, E. A. Fisher.

A rising vote of thanks was extended to the committee from Middlesex North "for taking the initiative in this work and organizing the convention."

It was voted that the treasurer of the Central Committee pay expenses incurred today by the convention.

At 4.20 o'clock it was voted to adjourn.

Sixty representatives were present during the convention. The greatest number of these present at any one time was fifty-one, and the least number at any time twenty-nine.

The above report is somewhat condensed, but is an accurate statement of the work of the convention.

Attest:

JOSEPH A. MEHAN,  
*Secretary.*



#### CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE TWO WEEKS ENDING SEPTEMBER 23, 1916.

September 9.

P. A. Surgeon G. W. Shepard, to Receiving Ship, Norfolk, Va., Sept. 25, 1916.

Asst. Surgeon W. M. Drum, M.R.C., appointed from August 25, 1916.

P. A. Surgeon M. A. Stuart, to Navy Yard, Norfolk, Va., Sept. 25, 1916.

P. A. Surgeon J. A. Biello, from N. Y. Recruiting Station, to Naval Hospital, Portsmouth, N. H.

Asst. Surgeon V. H. Carson, detached Marine Expeditionary Force, San Domingo, to *Castine*.

Asst. Surgeon J. T. Borden, detached Marine Brigade, Port-au-Prince, Haiti, to Inspector in the Haitian Constabulary.

Asst. Surgeon J. B. Helm, detached *Castine* to Inspector in the Haitian Constabulary.

Surgeon J. C. Pryor, detached Bureau of Medicine and Surgery, to Naval Medical School.

Surgeon F. X. Koltes, detached with the First Brigade of Marines, Port-au-Prince, Haiti, to director, Haitian Constabulary.

\* To be elected.

† No delegation sent to convention.

P. A. Surgeon John Buckley, commissioned from February 4, 1916.

Asst. Surgeon J. C. Rushmore, commissioned from August 10, 1916.

Asst. Surgeon Gordon Gibson, commissioned from August 10, 1916.

Asst. Surgeon C. H. Francis, commissioned from August 10, 1916.

September 11.

Medical Inspector N. J. Blackwood, detached Navy Yard, Boston, Mass., to command *Solace*.

Medical Inspector R. M. Kennedy, detached *Solace* to home, wait orders.

Surgeon J. F. Leys, to Navy Yard, Boston, Mass.

September 13.

Surgeon Karl Ohnesorg, detached Asst. Naval Attaché, Berlin, Germany, to leave of absence.

September 18.

Medical Director J. D. Gatewood, detached command Naval Medical School, Washington, D. C., to Bureau of Medicine and Surgery, Navy Department.

Medical Director E. R. Stitt, to command Naval Medical School, Washington, D. C., September 25, 1916.

Medical Inspector R. M. Kennedy, to command Naval Hospital, Washington, D. C.

Acting Asst. Surgeon Dunn, to Marine Recruiting Station, Atlanta, Ga.

September 19.

Surgeon J. S. Taylor, detached *Alabama* to Force Surgeon Reserve Force, Atlantic Fleet, on *Rhode Island*.

Surgeon H. C. Curl, detached Force Surgeon, Atlantic Fleet, to Marine Barracks, Port Royal, S. C.

P. A. Surgeon G. B. Tribble, to Naval Academy, Annapolis, Md., September 25, 1916.

September 20.

Surgeon H. F. Strine, to Naval Hospital and Medical School, Washington, D. C., September 25, 1916.

Surgeon R. W. Plummer to the *Alabama*.

Surgeon G. F. Freeman, detached *Tacoma* to home, wait orders.

P. A. Surgeon H. A. May, detached Marine Barracks, Port Royal, S. C., to home and wait orders.

P. A. Surgeon P. E. Garrison, detached *Dolphin* to Expeditionary Force, San Domingo.

P. A. Surgeon E. H. H. Old, detached Naval Medical School, and Naval Hospital, Washington, D. C., to *Solace*.

P. A. Surgeon D. G. Sutton, from *Chester* to Naval Medical School.

P. A. Surgeon D. G. Allen, to the *Chester*.

The following Assistant Surgeons, M.R.C., have been ordered to the Naval Medical School, Washington, D. C., September 25, 1916, for course of instruction:

L. H. Williams, F. F. Murdock, O. D. King, A. C. Stinton, C. H. Francis, J. J. Laughlin, J. A. Halpin, T. E. Cox, A. W. Hoagland, A. M. Larsen, F. T. Powers, I. W. Jacobs, A. H. Cecka, P. F. Prioleau, J. C. Bentley.

#### SOCIETY NOTICES.

**THE MASSACHUSETTS THERAPEUTIC MASSAGE ASSOCIATION.**—The next meeting will be held at the Hotel Brunswick, at 8.15 p.m., Thursday, October 12.

Dr. Hale Powers, assistant physician in nervous diseases at the Boston City Hospital, will address the Society on "Why Massage is Indicated in Epilepsy."

Members of the medical profession invited.

DOUGLAS GRAHAM, M.D., *President*,  
Hotel Brunswick.

MRS. MABEL F. WALKER, *Secretary*,  
115 Cedar Street, Malden, Mass.

**NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.**—Meeting for Medical Improvement at United States Hotel, Boston, Thursday, October 5, 1916, at 11.30 A.M.  
Reader: William H. Gilpatrick, D.M.D., of Boston.  
Subject: "Dental Radiography and Its Relation to Medicine." Illustrated with case histories. Stereopticon.

For Charles S. Adams, M.D., of Wollaston.

Other subjects which may be discussed are Physicians' Liability Insurance and "Workmen's Compensation Act." A full attendance desired.

F. H. MERRIAM, M.D., *Secretary*,  
South Braintree, Mass.

#### RECENT DEATHS.

**DR. STEPHEN WENDELL ABBOTT** died at a private hospital in Lawrence, September 1, 1916. He was a graduate of the Medical Department of New York University in 1879, joined the Massachusetts Medical Society in 1880, and had practised in Lawrence since that time, being retired from practice for several years. Formerly he was a member of the American Medical Association. He was for many years visiting physician to the Lawrence General Hospital and a member of the Lawrence Medical Club. He is survived by his widow, one daughter and one son.

**DR. ENRIQUE NUNEZ PALOMINA**, secretary of sanitation in the national policies of the island of Cuba, and a prominent figure in public life, died at a hospital in New York, on September 15, after undergoing two operations for an infection resulting from a cut. His case was aggravated by diabetes.

Dr. Nunez went to New York several weeks ago to investigate the methods being used to check the epidemic of infantile paralysis, because of the prevalence of that disease in Cuba, and also to visit curative springs in this country.

Dr. Nunez was born at Madruga, Havana province, on January 16, 1872. He was graduated from the University of Havana in 1886, and as a surgeon in 1893. Afterward he became professor of medicine at the university. He was appointed secretary of public health on April 23, 1913, but resigned on June 15 of the same year.

Reappointed to the cabinet, he resigned again in 1914. Later, he reentered the Government service as secretary of sanitation and was considered an expert in sanitation and preventive medicine.

**DR. EUGENE P. STONE, U.S.N.**, retired, who died recently at North Sutton, N. H., was a native of Boston. He was graduated from Harvard Medical School in the class of 1886, and entered the navy.

During his early life he saw considerable of army activities with his father, and had a part in the campaign against the Sioux Indians. Dr. Stone served in Alaska for a long time, and at one time was attached to the President's yacht *Mayflower*. He was with the fleet which made the cruise around the world during the Roosevelt administration, and for some time was attached to the naval station at Annapolis. He was for two and one-half years in charge of the medical department at the Charlestown Navy Yard, but in 1911 was ordered to proceed to the Philippines to command the medical department of the navy there.

He was obliged to resign this post in a short time on account of failing health, and he then retired from the navy. He spent two years in Colorado, hoping to regain his health, and the past two winters he passed in Florida.

He is survived by his widow and by two sons.